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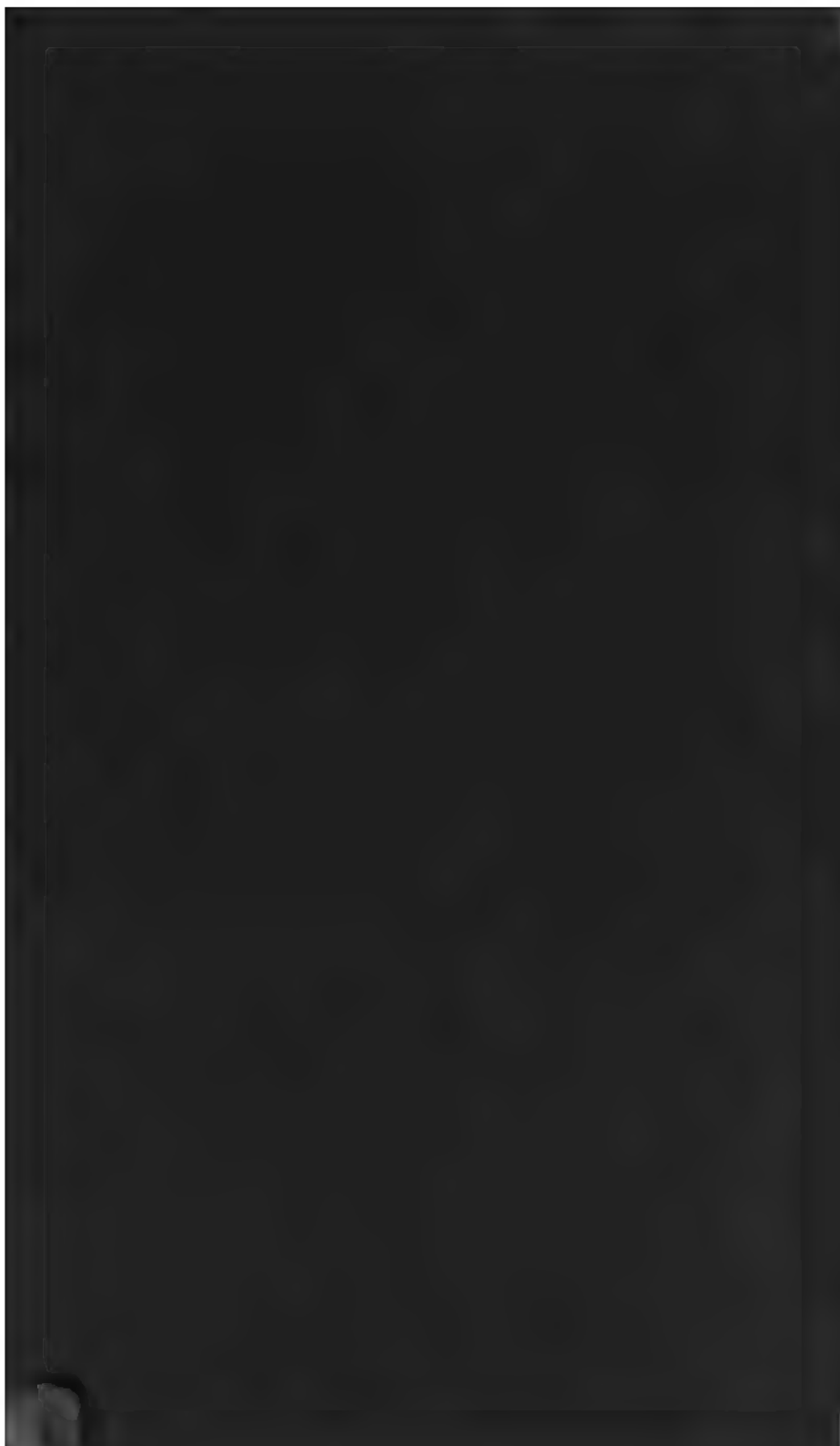
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V. 1011
Grand Folio



Grand Rapids, Mich. Public-service department.

THIRTY-FIRST
ANNUAL REPORT
OF THE
BOARD OF PUBLIC WORKS

**TO THE COMMON COUNCIL
OF THE CITY OF**

Grand Rapids, Michigan

**TRANSMITTING THE REPORTS OF THE
GENERAL SUPERINTENDENT, CITY ENGINEER,
CLERK, CHIEF INSPECTOR AND CASHIER**

FOR THE

YEAR ENDING APRIL 30, 1904.



**GRAND RAPIDS, MICH.
WEST MICHIGAN PRINTING CO.
1905**



Grand Rapids, Mich. Public service department.

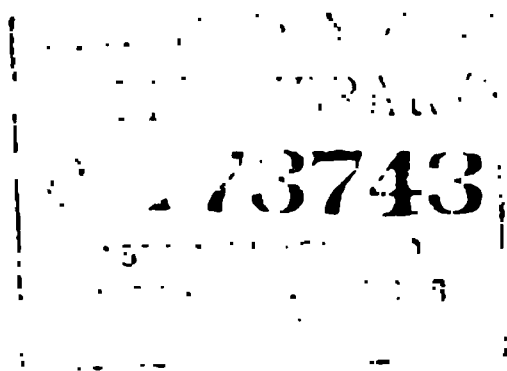
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GRAND RAPIDS, MICH.
WEST MICHIGAN PRINTING CO.
1905



ROY W. J. J.
J. J. J.
J. J. J.

BOARD OF PUBLIC WORKS.

MAY 1, 1904.

JAMES E. KEEGAN, Prest.....Term expires May, 1904
W. MILLARD PALMER, Mayor.....Term expires May, 1904
EDGAR S. KIEFER.....Term expires May, 1905
JOHN ROWSON.....Term expires May, 1905
MAURICE SHANAHAN.....Term expires May, 1906
SAMUEL G. BRAUDY.....Term expires May, 1906

OFFICERS.

BARNEY MEYER.....General Superintendent
L. W. ANDERSON.....City Engineer
JOHN C. BROWNClerk
ADOLPH WURZBURGChief Inspector

PAST AND PRESENT OFFICERS OF THE BOARD OF PUBLIC WORKS.

PRESIDENTS.

Thomas D. Gilbert.....April, 1873, to May, 1878
James Miller.....May, 1878, to November, 1879
George W. ThayerNovember, 1879, to May, 1888.
George G. Briggs.....May, 1888, to May, 1890.
James N. Davis.....May, 1890, to May, 1892.
William R. Shelby.....May, 1892, to May, 1893.
Frances Letellier..May, 1893, to May, 1896.
C. G. Swensburg.....May, 1896, to October. 1897.
Enos PutmanOctober, 1897, to January, 1898.
Dudley E. Waters.....January, 1898, to May, 1898.
William T. Johnson.....May, 1898, to May, 1899.
Dudley E. Waters.....May, 1899, to May, 1901.
Orson A. BallMay, 1901, to May, 1902.
Joseph EmmerMay, 1902, to May, 1903.
James E. Keegan.....May, 1903, to May, 1904.

CLERKS.

A. M. Warrell.....April, 1873, to August, 1875.
A. B. FarnsworthAugust, 1875, to February, 1878.
Fred A. TwamleyFebruary, 1878, to May, 1900.
Will J. Sproat.....May, 1900, to July, 1902.
John C. BrownJuly, 1902, to

CITY ENGINEERS.

E. W. Muencher.....April, 1873, to May, 1877.
A. C. SekellMay, 1877, to May, 1883.
H. A. CollarMay, 1883, to October, 1896.
Geo. M. Ames (acting).....October, 1896, to March, 1898.
Geo. M. Ames.....March, 1898, to May, 1900.
L. W. Anderson (acting)...May, 1900, to May, 1901.
L. W. Anderson.....May, 1901, to

ENGINEERS OF PUMPING STATION.

Demetrius Turner.....May, 1874, to May, 1884.
Geo. E. KirkMay, 1884, to July, 21, 1892.
E. A. Bates.....July, 1892, to April, 1900.
Barney Meyer.....April, 1900, to

**SUPERINTENDENT OF PUMPING AND LIGHTING
STATIONS.**

John L. ShawJuly, 1899, to March 18, 1900.
Barney Meyer.....April, 1900, to

**SUPERINTENDENT OF REPAIRS AND
CONSTRUCTIONS.**

Thomas Farmer, jr.....May, 1878, to May, 1880.
A. C. SekellMay, 1880, to May, 1883.
John Van Amberg.....May, 1883, to May, 1900.

INSPECTOR OF WATER WASTE.

A. Per Lee.....July, 1885, to May, 1900.

CHIEF INSPECTOR.

Adolph Wurzburg.....May, 1900, to

REPORT OF THE BOARD OF PUBLIC WORKS.

GRAND RAPIDS, Mich., May 1, 1904.

To the Honorable Common Council:

GENTLEMEN—Herewith are transmitted annual reports from the departments of the municipal government under the control of this Board.

We would respectfully refer you to the report of the City Engineer for information relative to street improvements and the construction of sewers, bridges, laying water mains, etc., to the reports of the General Superintendent for information in reference to the work of the lighting plant, the pumping station and the repair shops; to the Chief Inspector's report for information in reference to services and fixtures, and to the Clerk's report for information relative to the receipts and expenditures in the Water Works and Lighting departments for the past year.

Respectfully submitted,

JAMES E. KEEGAN, President.

JOHN ROWSON,

EDGAR S. KIEFER,

M. SHANAHAN,

SAMUEL G. BRAUDY,

W. MILLARD PALMER, Mayor.

CLERK'S ANNUAL REPORT.

OFFICE OF THE BOARD OF PUBLIC WORKS, }
GRAND RAPIDS, Mich., May 1, 1904. }

To the Honorable Board of Public Works:

GENTLEMEN—I respectfully submit to your honorable body the following reports of the receipts of and the disbursements from the Water Works, Water Works Extension and Lighting funds for the fiscal year ending April 30, 1904.

WATER WORKS DEPARTMENT.

The receipts of the water works department for the year ending April 30, 1904, were as follows:

From water rates and fines.....	\$ 118,488 13	
From water permits ...	907 50	
From sale of labor and material	7,416 66	
From plumbers' licenses	280 00	
Accrued interest on water works extension bonds.....	805 11	
Total income of water works fund		\$ 127,897 40
The total income of this department from the beginning of collections. from May 1, 1874, to May 1, 1903, was.....		1,564,119 26
For the past year.....		127,897 40
Total income to date ...		\$1,692,016 66

56511
38991
139502

DISBURSEMENTS.
CONSTRUCTION.

Extension and relaying of mains	\$ 3,165 64	
New meters.....	6 50	
Setting meters.....	2,056 68	
Intake.....	103 97	
New tell tale pipe.....	708 82	
Miscellaneous.....	105 43	
Total paid on construction account.....		\$ 6,147 04
Paid previous to May 1, 1903.....		1,499,373 97
Total investment to date.....		\$ 1,505,521 01

MAINTENANCE AND OPERATION.**1—PUMPING STATION.**

Superintendence	\$ 1,867 38	
Engineers.....	4,839 35	
Firemen and coal passers.	2,830 86	
Extra help.....	422 14	
Buildings and grounds.....	955 22	
Engines	790 18	
Boilers	3,042 82	
Auxiliary machinery.....	4,282 60	
Coal (including old bills).....	31,737 92	
Oils....	657 29	
Waste...	420 04	
Supplies and tools....	1,554 11	
Miscellaneous...	125 30	
Total.....		\$ 53,515 21

2—DISTRIBUTION.

Repairing mains.....	5,554 97	
Reading meters.....	1,641 44	
Repairing meters.....	1,116 56	
Supplies and tools.....	1,490 64	
Stables	1,303 52	
Reservoir.	1,113 24	
Fire hydrants	2,278 71	
Sprinkling hydrants	201 24	
Valves.....	185 23	
Services	3,434 87	
Repair shop and store house.....	1,482 80	
Miscellaneous.....	210 49	
Total		\$ 20,013 71

3—OFFICE.

One-fourth clerk's salary.....	\$ 375 00	
Deputy clerk, bookkeeper, cashier and assistants.....	1,722 50	
Books, blanks and stationery.....	351 68	
Postage.. ..	50 51	
Miscellaneous.....	498 74	
Advertising.....	91 34	
Total....		\$ 3,089 77

4—INSPECTORS.

Chief inspector, three assistants and two meter readers-.....	\$ 3,524 14	
All supplies, etc., for the inspection department are charged to the office account.		

RECAPITULATION.

Pumping Station....	\$ 53,515 21	
Distribution.....	20,013 71	
Office	3,089 77	
Inspectors	3,524 14	
Total for maintenance and operation		\$ 80,142 83

Construction.....	\$ 6,147 04
Interest and exchange ..	39,203 24
Interest on water works extension bonds.....	1,400 00
Refunded water rates.....	180 20
Total disbursements	\$ 127,073 31 /
Total paid for maintenance and operation previous to May 1, 1903	\$ 832,837 21
Paid during the past year.....	80,142 83
Paid during the past year water works extension	58,958 92
Total to date	\$971,938 96
Cash on hand May 1, 1903 ...	\$ 4,442 90
Receipts for past year	127,897 40
Total	\$ 132,340 30
Disbursements past year.....	\$ 127,073 31 .
Cash on hand May 1, 1904.....	5,266 99
Total.....	\$ 132,340 30

WATER WORKS EXTENSION FUND.

As stated in the last annual report, \$170,000.00 of Water Works Extension bonds were voted at the spring election of 1903. Of this \$170,000, \$80,000 were issued during the year, the first amount being for \$4,000, issued July 16, 1903, and the last for \$21,000, issued on the 31st day of December, 1903. These bonds were deposited with a local bank and drew interest until the amount was placed in the funds of the city. From the time they were issued until turned over for our use, interest was drawn amounting to \$805.11, which was later transferred to the Water Works fund, from which fund all of the interest on the Water Works Extension bonds was paid. The total amount of interest paid was \$1,400, that being the amount due on the \$80,000, at 3½ per cent for six months.

The total disbursements from the Water Works Extension fund amounted to \$58,958.92, and the balance in the fund is \$21,055.

The following is a detailed statement of the receipts and disbursements :

July 16, 1903, sale of bonds.	\$ 4,000 00	
Sept. 4, 1903, sale of bonds ..	10,000 00	
Sept. 23, 1903, sale of bonds.....	20,000 00	
Sept. 29, 1903, sale of bonds...	25,000 00	
Dec. 31, 1903, sale of bonds	21,000 00	
Sale of material	6 96	
Accrued interest	805 11	
Total		\$ 80,812 07

DISBURSEMENTS.

Labor and material, laying mains, etc	\$ 58,951.96	
Transferred to Water Works fund.....	805 11	
Total.....		\$ 59,757 07
Leaving a balance in the fund		\$ 21,055 00

LIGHTING DEPARTMENT.

RECEIPTS.

Balance in the fund April 30, 1903.....	\$ 918 24	
Budget appropriation public lighting fund	25,000 00	
Budget appropriation extension fund.....	2 500 00	
Budget appropriation repairing towers	600 00	
Installing lights at railway crossings	1,510 42	
Installing lights Oak Hill cemetery	303 18	
City orders returned.....	35 20	
Sale of steam power to Edison Co.....	187 00	
Total credits		\$ 31,054 04

CONSTRUCTION AND EXTENSION.

Lines and cables.	\$ 3,644 80	
Lamps.....	688 79	
Total		\$ 4,333 59

MAINTENANCE AND OPERATION.

1-STATION.

WAGES.

Superintendence.....	\$ 600 08	
Clerk	410 13	
Engineers	1,938 46	
Firemen, coal passers and oilers	1,741 96	
Dynamo tenders....	1,320 02	
Trimmers and linemen	3,358 16	
Total wages.....		\$ 9,368 81
Buildings and grounds		406 20
Engines		85 33
Boilers		358 98
Coal		10,965 30

Oils.....	\$ 381 92
Waste.....	245 85
Dynamos.....	84 57
Switchboard and connections (including lightning arresters)...	429 02
Supplies and tools.....	929 06
Miscellaneous.....	990 81
Total.....	\$ 24,145 85

2—DISTRIBUTION.

Lines and cables.....	\$ 441 43
Lamp posts.....	1 47
Towers.....	63 81
Lamps.....	947 83
Globes.....	602 28
Carbons.....	790 76
Trimming.....	2 50
Stable.....	728 03
Miscellaneous.....	9 00
Total.....	\$ 3,677 11

3—OFFICE.

One-fourth salary of clerk.....	\$ 375 00
Printing and stationery.....	3 45
Miscellaneous.....	5 00
Total.....	\$ 383 45

RECAPITULATION.

Construction and extension.....	\$ 4,333 59
Station.....	\$ 24,145 85
Office.....	383 45
Distribution.....	3,677 11
Total for maintenance and operation.....	\$ 28,206 41
Total disbursements.....	32,540 00
Overdraft April 30, 1904.....	1,485 96
Total amount paid for construction previous to May 1st, 1903....	\$ 198,553 30
Paid during the past year.....	4,333 59
Total investment to date.....	\$ 202,486 89

The bonded indebtedness is \$125,000.00, and the interest and exchange for the past year amounted to \$5,012.25, \$12.25 of which was for exchange and commission.

Respectfully submitted,

JOHN C. BROWN,
Clerk.

CASHIER'S ANNUAL REPORT.

GRAND RAPIDS, MICH., May 1, 1904.

To the Honorable Board of Public Works :

GENTLEMEN—I herewith submit a report as cashier of said Board at the close of the year, May 1, 1904:

Balance on hand, May 1, 1903.....	208 82	
Received from water rates.....	\$118,488 13	
Received from water permits	907 50	
Received from miscellaneous receipts.....	7,725 66	
Total receipts.....	\$127,121 29	
DEPOSITS		
To water works fund.....		\$ 124,970 39
To general fund.....		29 00
To public lighting fund.....		1,917 60
To water works extension fund.....		6 96
Balance on hand, May 1, 1904.....		406 16
Total.....	\$127,330 11	\$127,330 11

Respectfully submitted,

CHARLES D. STEBBINS, Cashier.

CHIEF INSPECTOR'S REPORT.

GRAND RAPIDS, Mich., April 30, 1904.

To the Honorable Board of Public Works:

GENTLEMEN—Herewith is respectfully submitted the annual report of the Inspection department for the year ending April 30, 1904 :

WATER SERVICES.

Number of schedule services	9,699
Number of metered services.	2,766
Number of services to curb.....	607
Total	<u>13,072</u>

Distributed as follows :

NORTH DISTRICT.

Schedule.....	3,605
Metered	1,073
To curb or lot line.....	286
Total	4,964 00

SOUTH DISTRICT.

Schedule	3,387
Metered	858
To curb or lot line	180
Total	4,425

WEST DISTRICT.

Schedule	2,707
Metered	835
To curb or lot line	141
Total	3,683

Total number of private meters	253
Number of services cut off at main and abandoned	180
Number of services discontinued and consumers using water furnished by Hydraulic Company.....	231
Number of services for elevators:.....	40
Number of services for fire protection	108

WATER FIXTURES.

Baths.....	2,457
Hopper closets.....	2,370
Tank closets.....	5,080
Basins.....	2,479
Sinks.....	3,086
Urinals.....	30
Hydrants.....	5,598
Sill cocks.....	5,439
Hydraulic pumps.....	304
Private water troughs.....	34
Public water troughs.....	11
Sprinkling cranes.....	27
Miscellaneous.....	783
Total.....	27,698

Distributed in the several districts as shown in the following table:

WARDS.	Baths.	Hopper Closets.	Tank Closets.	Basins.	Sinks.	Urinals.	Hydrants.	Street Cocks.	Hydraulic Pumps.	Private Water Troughs.	Public Water Troughs.	Sprinkling Cranes.	Miscellaneous.	Total.
First and Twelfth	132	211	285	137	239	.....	849	394	4	3	1	5	35	2,295
Tenth and Eleventh	803	601	1,497	893	859	4	1,306	1,807	74	8	.....	8	188	8,047
Third	557	490	1,228	593	622	5	741	1,217	125	.....	2	3	277	5,868
Second, Fourth and Fifth ..	518	409	1,045	516	824	8	856	932	87	7	6	4	201	5,413
Sixth and Seventh	269	486	637	193	326	3	1,309	644	12	12	2	4	34	3,951
Eighth and Ninth	149	173	370	136	203	1	521	492	2	4	.....	3	35	3,018
Engine Houses	10	.....	14	10	13	9	4	23	.....	.....	.....	.....	13	96
Parks .....	.....	.....	.....	.....	.....	.....	12	.....	.....	.....	.....	.....	.....	12
Cemeteries .....	.....	.....	4	2	1	.....	1	.....	.....	.....	.....	.....	.....	8
Grand Total	2,457	2,370	5,080	2,479	3,086	30	5,598	5,439	304	34	11	27	783	27,698

The above table includes the fixtures on schedule services only. It is contemplated during the coming year to make a thorough house to house inspection, and a complete list of fixtures on all services will be contained in my next annual report.

Total number of water permits issued from April 30, 1903, to April 30, 1904, 359.

Embodied in the following statement is a report of the work done by the inspectors in this department during the past year:

Number of inspections and investigations made and notices served.....	9,750
Number of meter readings.....	25,131
Number of water services to curb inspected.....	195
Number of high reading meter notices.....	1,069
Number of water waste notices served.....	305
Number of leaks found and owners notified.....	1,187
Number of notices to property owners to make water connections.....	200
Number of water services turned on	843
Number of water services turned off.....	959
Number of fixtures capped and uncapped.....	57
Number of hopper closet permits granted.....	91
Number of reports and applications made to the Board by Chief Inspector.....	69

HOUSE INSPECTIONS.

On account of the unusually severe weather the past winter, and the great amount of extra work in this department in consequence thereof, the inspectors were unable to make many inspections of houses. During the coming year, however, it is contemplated that a complete inspection of every house supplied with city water will be made, and in order that this important work may be done in a thorough manner, it will be necessary to temporarily increase the number of inspectors. I am informed by the General Superintendent that he can supply such additional help from his department, and I would recommend that as they are experienced men in such work, they be employed for such length of time as shall be necessary to complete this work in a satisfactory manner.

METERS.

During the past year the number of services metered has been increased to 2,766. About 250 meters have been placed on services having hopper closets and where an inspection made showed that water was being wasted. I respectfully recommend that meters be installed on as many services of this kind as is possible during the coming year, as it has been demonstrated that in pursuing this policy, the water department is on the right track in its efforts to curtail the waste.

Respectfully submitted,

A. WURZBURG,
Chief Inspector.

GENERAL SUPERINTENDENT'S REPORT.

To the Honorable Board of Public Works.

GENTLEMEN—I herewith submit annual reports for the city lighting plant, city pumping station and city repair shops, for the year ending April 30, 1904.

LIGHTING PLANT.

MACHINERY.

The increased number of lamps in circuit has brought the engine load up to their rated horse-power, and a shrinkage crack has developed on all three engines in the high pressure cylinder. This did not show during the life of the guarantee, and this department is now awaiting an answer from the Arbuckle-Ryan Co., the contractors who furnished the Russell engines, and who have been asked to furnish new cylinders in place of those now in use. If the Arbuckle-Ryan Co. refuse to do so, the expense to the city will be \$900, or \$300 per cylinder.

Boilers, pumps, dynamos and auxiliary machinery are in good condition. The sum of \$290 will have to be expended to replace the pipe covering damaged by the high water. The above amount covers practically all damages resulting from the flood.

CIRCUITS.

Two entire new circuits were built and put into service during the past year, making a total of ten circuits now in commission.

LAMPS.

The lamp repair department has been removed from the lighting station to the city repair shops, which enables this

department to show a reduction on the cost of repairs, all parts being made in our shops and the greatest saving being made in the winding of the spools, which was formerly done outside.

ESTIMATES.

The amount asked for each year has always been reduced \$1,000.00 per year, and now at the end of four years the fund is practically \$4,000.00 overdrawn, and I respectfully ask that not less than \$30,000.00 be placed in the operating fund, which will allow this department to keep within the appropriation and not show an overdraft at the close of each year.

EXTENSION.

I respectfully recommend that the sum of \$2,000.00 be placed in the Extension fund for the purpose of erecting an additional lamp on Canal and Monroe streets between each lamp now in service, and also that an ornamental iron pole be placed in the center of Campau square, the same to have four lamps on it.

BUILDING AND GROUNDS.

I wish to call the attention of your honorable body to the saving that would be effected by moving the city lighting plant to the city pumping station site. The difference in the pay rolls alone would amount to \$8,536.00 per year. In the summer months the lighting load would not come on until after the peak on the sprinkling load was off. I most earnestly ask that the committee on Lighting thoroughly investigate this proposition.

The doorways or jambs at the city lighting plant should be raised at least eighteen inches, the basement windows should be bricked up and the steam header moved from the basement to the engine room. By this arrangement the lighting plant would be able to run regardless of the high water or floods in the spring.

PUMPING STATION.

PUMPS.

During the past cold season the amount of water pumped per day reached a maximum of 21,000,000 gallons and forcibly brought to the attention of this department the fact that any break-down, either on the Nordberg or Holly engines, would mean great danger from fire, as the Butterworth pumps would not be able to supply the demand.

I respectfully recommend that your honorable body take such action as will, in the near future, result in the installation of a 20,000,000 gallon vertical triple expansion pumping engine.

During the year both the Holly and Nordberg pumps were equipped with new valves and are now in good condition.

BOILERS.

During the past year the two new boilers were put into service. The Nos. 3 and 4 boilers require resetting throughout.

TELL-TALE.

During the past year a 2 in. Tell-tale was put in service between the reservoir and the pumping station, at a cost of \$1,440.68. This will effect a saving in wages and telephone rent of \$570.00 a year, and will also enable us to know the exact height of the water in the reservoir at any time. Before the installation of this Tell-tale, this was impossible.

REPAIR SHOPS.

During the past year, one 30-inch lathe and one 16-inch turret lathe have been added to the shop equipment. The 30-inch lathe enables this department to take care of all the heavy machine work, thus doing away with bills for lathe work from other machine shops.

The turret lathe is equipped with all the necessary tools for making corporation cocks and other brass goods used by

this department, thereby greatly reducing the cost of their production.

I wish to call the attention of your honorable body to the condition of the Road Roller Shed, and respectfully ask that suitable quarters be secured for the wintering and repairing of the road rollers. The present quarters are not large enough to accommodate the four rollers.

On account of the severe weather during the past winter, this department has been called upon to cut off a great many mains on account of their being frozen. In some cases it has been necessary to cut off a large district on account of a single small leak, for the reason that under the present conditions the valves are not located close enough together. I would respectfully ask that your honorable body call for an estimate of cost for the purpose of installing additional valves.

During the past year a few meters were set on hopper closets. but there were not enough set to make a perceptible showing in reducing the amount of water pumped, and I respectfully recommend that the entire system be metered as rapidly as possible, as it is my opinion that the total amount of water pumped could be reduced, in this way, to 8,000,000 gallons per day.

I wish to thank the members of the Board and all employes for their hearty co-operation during the past year.

Respectfully submitted,

BARNEY MEYER,
General Superintendent.

CITY LIGHTING PLANT.

SUMMARY OF REPORT ENDING APRIL 30, 1904

Average number of lamps operated per day 623.

Average number of hours operated per day 10 23.

	Total Cost.	Average Cost per day	Average Cost per lamp, per day.	Average Cost per kilo- watt hour
Coal	\$10 200 78	\$ 28 41	04560191	01068447
Wages	10 260 31	28 46	04568210	01070327
Carbons	717 20	2 00	00321028	000752163
Globes	409 04	1 14	00182986	000429733
Repairs	2 532 72	7 06	01131621	002031373
Supplies	2 429 47	6 77	01096077	025490069
Cylinder oil	241 80	67	00107544	000251974
Machine oil	130 34	36	00057796	000135289
Totals	\$26,677 66	\$ 74 86	12016061	028159441

Average cost per lamp per year (operation only) on above basis, \$43.85.

SUPPLY RECORD

	Total Cost of supplies per month	Average Cost per day	Average Cost per lamp per day	Average Cost per kilo watt hour
May	\$ 160 65	\$ 5 18	008593	00276862
June	303 78	6 79	0110588	0030544
July	148 59	4 80	007692	0025131
August	243 57	7 86	012702	0037145
September	132 46	4 42	007045	0017831
October	283 83	9 16	01472671	00314345
November	172 11	5 71	00924315	00180447
December	177 65	5 73	0092271	001587697
January	190 71	6 44	010158	0018645
February	248 33	8 66	0 3306	00259195
March	237 89	7 71	0149528	00307766
April	220 90	7 08	0123673	003257
Totals	\$2,429 47			
Averages	202 46	\$ 6 77	0086677	002540009

CYLINDER OIL RECORD.

	Total Cost per month	Average Cost per day	Average Cost per lamp per day	Average Cost per kilo watt hour
May.....	\$ 26 00	\$.84	.00139303	.00044895
June.....	26 00	.83	.0013519	.0004467
July.....	14 00	.45	.000732	.0002357
August.....	25 00	.81	.001300	.0003885
September.....	25 00	.83	.001333	.0003863
October.....	25 00	.80	.0012962	.00037453
November.....	25 00	.83	.0013353	.0003693
December.....	25 50	.82	.0013204	.0002721
January.....	9 55	.31	.000482	.0000607
February.....	15 50	.54	.0008451	.0001761
March.....	15 00	.60	.0008434	.00019417
April.....	11 25	.25	.0005637	.0001434
Totals.....	\$ 241 30			
Averages.....	20 15	\$.67	.00107544	.000351974

ENGINE OIL RECORD.

	Average Cost per month.	Average Cost per day.	Average Cost per lamp per day	Average Cost per kilowatt hour.
May.....	\$ 10 20	\$.33	.00054727	.00017637
June.....	10 20	.34	.00055385	.000183
July.....	10 40	.35	.000561	.0001833
August.....	9 80	.31	.000501	.0001465
September.....	14 70	.49	.000787	.0001979
October.....	11 04	.36	.00057878	.00012354
November.....	10 40	.35	.00056351	.00011003
December.....	11 00	.35	.0005797	.000099751
January.....	10 00	.32	.0005048	.0000936
February.....	11 00	.33	.0005947	.000124
March.....	10 70	.43	.0006762	.00013916
April.....	10 50	.36	.0005797	.0001536
Totals.....	\$ 130 34			
Averages.....	10 80	\$.36	.00057785	.000135389

LAMP RECORD

	Lamps in circuit per day	Reported out per day	Operated per day	Av Hours operated per day	Av kilowatt hours per day
May	606	3	603	7 35	1871
June	615	1	614	7 13	1858
July	626	2	624	7 00	1910
August	622	3	619	8 44	2116
September	624	1	623	10 07	2470
October	624	2	622	11 59	2914
November	625	4	621	12 45	3181
December	625	4	621	13 33	3609
January	637	3	634	13 08	3454
February	641	2	639	12 13	3066
March	641	5	636	11 00	3080
April	627	6	621	9 21	2358
Averages	626	3	623	10 23	2650

WAGE RECORD.

	Total monthly pay roll	Average Daily pay roll	Average Wages per lamp per day	Average Cost per kilo-watt hour
May	\$ 726 30	\$ 23 43	03885	.02522
June	946 80	31 64	06143	0170399
July	781 50	25 21	040401	013199
August	778 80	25 13	0406	0115761
September	1,026 26	34 21	05491	0138161
October	751 40	24 24	038971	00631847
November	931 20	31 04	.0490839	06275791
December	813 47	26 34	0422544	007270713
January	823 97	26 58	041924	0076655
February	828 07	28 41	04446	0092661
March	909 30	30 38	0526015	0125385
April	809 97	27 93	0440771	011845
Totals	\$10,216 31			
Averages	851 36	\$ 28 44	.04568219	.01070327

REPAIR RECORD.

	Total Cost per month	Average Cost per day	Average Cost per lamp per day	Average Cost per kilo-watt hour
May.	\$ 181 37	\$ 5 85	.009703	.00312667
June.....	97 68	3 26	.0053095	.0017546
July	231 36	7 46	.011955	.0039058
August	198 47	6 40	.010339	.0030246
September	354 93	11 83	.018989	.0047781
October	375 22	12 10	.0194534	.00415237
November	263 68	8 79	.0141546	.00276329
December.....	206 47	6 66	.0107246	.001845387
January.....	226 29	7 30	.0115142	.0021135
February.....	180 48	6 22	.009734	.0020287
March.....	109 98	4 40	.0069183	.00142393
April	106 79	3 68	.0059259	.0015606
Totals.....	\$2,532 72	.....	.....	.....
Averages	211 06	\$ 7 05	.01131621	.002651373

CARBON RECORD.

	Total Carbons used per month	Total Cost per month	Average Carbons used per day	Average Cost per day
May.....	2,103	\$ 55 71	68	\$ 1 80
June.	1,939	51 36	65	1 71
July.....	1,953	51 73	63	1 67
August	1,990	52 71	64	1 70
September.....	2,126	56 32	71	1 88
October	2,393	63 39	77	2 06
November.....	2,364	62 62	79	2 09
December.....	2,709	71 76	87	2 31
January	2,604	63 98	83	2 22
February.....	2,570	68 08	88	2 35
March	2,171	57 51	87	2 30
April	2,153	57 03	74	1 96
Totals.....	27,075	\$ 717 20	.....	.....
Averages.....	2,256	59 77	75	\$ 2 00

	Average Used per lamp per day	Average Cost per lamp per day	Average Cost per kilo-watt hour
May	11	002986	00126205
June	11	002785	000930
July	10	002676	0018735
August	10	002743	0008034
September	13	003018	0007593
October	12	00325681	0007035
November	12	00336554	00085703
December	14	0037199	000640066
January	13	003602	0006427
February	14	0036776	0007665
March	14	0036164	00074433
April	12	0031547	0008312
Totals	..	..	..
Averages	12	00321028	000752163

COAL RECORD

	Total pounds consumed per month	Total Cost per month	Av pounds consumed per day	Average Cost per day.
May	351 957	\$ 724 06	11 353	\$ 23 39
June	337,452	638 2	11 248	21 28
July	355,220	632 17	11,459	20 39
August	393,360	682 06	12 680	22 00
September	450,281	787 85	15 008	26 26
October	541 481	970 87	17 467	31 32
November	573,836	1047 29	19,127	34 91
December	617 240	1126 37	19,911	36 34
January	646,538	1179 52	20,856	35 06
February	527 434	962 49	18,187	33 19
March	463,508	821 86	18,540	32 87
April	424 867	627 07	14 651	21 62
Totals	5,683,144	\$ 10,200 78	..	..
Averages	473,596	\$ 850 06	15,830	\$ 28 41

	Av. pounds per lamp per day.	Average Cost per lamp per day.	Av. pounds per K W. hour per day.	Average Cost per K. W. hour per day.
May	18.8	.03879	6.06	.012502
June.....	18.3	.034658	6.05	.0114532
July	18.4	.032676	6.	.0106754
August.....	20.5	.03554	6.	.010397
September.....	24.1	.04215	6.06	.010606
October.....	28.1	.0503537	6.	.01074811
November.....	30.8	.0562158	6.01	.01097454
December.....	32.1	.0585185	5.52	.010069271
January.....	32.9	.060016	6.04	.0110163
February	28.5	.0519405	6.	.0108252
March.....	29.1	.0516824	6.	.0106376
April	23.6	.0348149	6.21	.0091688
Totals.....	.....	.....	.....	.....
Averages.....	25 4	.04560191	5.95	.01068447

GLOBE RECORD.

	In'r globes used per month	Outer globes used per month	Cost of In- ner & outer globes per month	Av. Inner globes us-d per day	Av. Outer globes used per day	Av. Cost In- ner & outer globes per day
May.....	230	15	\$ 32 96	8	.5	\$ 1 06
June.....	234	16	32 90	8	.5	1 10
July.....	305	13	38 29	10	.4	1 24
August.....	244	17	34 43	8	.5	1 11
September	252	5	28 34	9	.2	94
October.....	259	6	29 39	9	.2	95
November.....	283	13	37 00	9	.4	1 23
December	335	8	40 33	11	.3	1 30
January	285	4	33 69	9	.1	1 09
February.....	256	2	27 56	9	.1	95
March.....	248	15	34 68	9	.6	1 39
April	277	24	39 48	10	.1	1 35
Totals.....	3,208	138	\$ 409 04	.....	.....	.....
Averages.....	267	12	34 09	9	.4	\$1 14

	Average Inner globes used per lamp per day	Average Outer globes used per lamp per day	Average Cost of globes used per lamp per day	Average Cost of globes per K. W. hour
May . . .	01296	000829	0017579	0005664
June . .	01303	0008443	0017916	0005992
July	01502	0008411	001987	0006402
August . .	01292	00080775	001791	0005246
September	01444	0008210	0017500	0005797
October . .	01447	0008215	00172733	00052661
November	01443	0008442	00199068	0006007
December	01771	0008631	0020634	00060211
January	01420	0008577	0017193	0005156
February	01408	0008585	0014807	0005085
March	01415	0008487	0021835	00044683
April	01610	00161031	0021732	0005725
Totals				
Averages	01445	00082064	00182886	000428733

SUMMARY.

ANNUAL REPORT CITY PUMPING STATION FOR THE YEAR ENDING APRIL 30, 1904.

	Total Cost of	Average Cost per day of	Av. Cost per 1,000,000 gals. of
Coal	\$ 24,332 26	\$ 66 48	\$ 4 72
Wages.....	9,335 26	25 51	1 81
Repairs	2,276 34	6 22	44
Supplies.....	2,570 72	7 02	50
Oils.....	630 48	1 72	12
Totals	\$ 39,145 06	\$ 106 95	\$ 7 59

WAGE RECORD.

	Average Cost per month.	Average Cost per day.	Average Cost per 1,000,000 gals.
May	\$ 715 72	\$ 23 09	\$ 1 72
June.....	715 56	23 85	1 62
July	897 54	28 96	2 00
August.....	717 76	23 15	1 61
September.....	897 20	29 91	2 25
October	717 76	23 15	1 81
November.....	897 20	29 91	2 36
December.....	717 76	23 15	1 73
January	717 76	23 15	1 64
February.....	716 27	24 70	1 57
March.....	885 97	28 58	1 83
April.....	738 76	24 63	1 67
Totals.....	\$ 9,335 26	.....	.....
Averages.....	\$ 777 94	\$ 25 51	\$ 1 81

COAL RECORD

	Total lbs. consumed per month	Total Cost of coal consumed per month	Av. lbs. consumed per day	Av. Cost of coal con- sumed per day	Av. lbs. per 1,000, 000 gallons	Av. Cost per 1,000, 000 gallons
May	1,037,815	\$ 1,808 54	33,478	\$ 58 34	2,500	\$ 4 36
June	1,036,000	1,045 60	34,533	65 52	2,389	4 52
July	1,008,750	1,008 75	34,474	64 16	2,389	4 43
August	1,009,050	2,000 29	34,485	60 46	2,401	4 63
September	998,350	1,892 12	33,378	63 07	2,513	4 76
October	950,800	1,850 04	30,671	50 08	2,402	4 67
November	944,740	1,842 64	31,492	61 40	2,406	4 85
December	1,091,350	2,127 91	35,205	68 64	2,637	5 14
January	1,050,950	2,006 87	34,192	60 67	2,430	4 74
February	1,000,100	2,008 50	30,555	60 27	2,324	4 39
March	1,276,200	2,302 71	41,168	76 22	2,639	4 88
April	1,292,300	2,368 40	43,077	78 61	2,941	5 36
Totals	12,885,415	\$ 24,312 26		..		..
Averages	1,073,794	\$ 2,027 60	35,300	\$ 66 48	\$ 2,468	4 72

SUPPLY RECORD

	Total Cost per month	Average Cost per day	Average Cost per 1,000,000 gallons
May	\$ 370 29	\$ 11 94	\$ 89
June	135 89	4 53	31
July	182 23	5 88	41
August	312 06	10 07	70
September	285 22	9 50	71
October	159 49	4 18	33
November	231 90	7 73	60
December	301 72	9 73	72
January	208 74	6 73	50
February	12 72	4 20	26
March	130 01	4 19	26
April	161 43	5 37	35
Totals	\$2,570 72		..
Averages	214 23	\$ 7 02	\$ 50

OIL RECORD.

	Cost per per month	Average Cost per day	Average Cost per 1,000,000 gallons
May	\$ 56 70	\$ 1 83	\$.14
June.....	57 72	1 93	.12
July	57 74	1 86	.13
August.....	52 44	1 69	.11
September	51 20	1 71	.13
October	45 99	1 48	.12
November.....	53 50	1 79	.14
December.....	53 08	1 72	.13
January	59 39	1 92	.13
February	50 21	1 73	.12
March.....	41 11	1 33	.09
April	51 40	1 72	.11
Totals.....	\$ 630 48	.....	.....
Averages.....	52 58	\$ 1 72	\$.12

REPAIR RECORD.

	Total Repairs for month.	Av. Repairs per day.	Av. Cost of repairs per 1,000,000 gals.
May	\$ 225 95	\$ 7 29	\$.55
June.....	143 23	4 77	.33
July.....	87 47	2 82	.20
August	266 95	8 61	.59
September	564 64	18 82	1.42
October	142 92	4 61	.36
November.....	159 18	5 30	.42
December.....	179 31	5 78	.43
January.....	161 45	5 21	.37
February.....	45 08	1 55	.10
March.....	165 90	5 35	.34
April.....	134 26	4 48	.30
Totals.....	\$ 2,276 34	.....	.....
Averages.....	\$ 189 70	\$ 6 22	\$.44

WATER REPORT.

Table showing the amount of water pumped into the high and low services for the year ending April 30, 1904 and the total pumping record

	LOW SERVICE		HIGH SERVICE	
	Total gallons pumped per month	Average gallons pumped per day	Total gallons pumped per month	Average gallons pumped per day
May	228,745,215	7,879,878	196,293,156	6,009,134
June	256,445,799	8,514,860	182,075,824	6,069,184
July	276,455,999	8,888,903	174,214,442	5,620,466
August	282,143,214	9,101,394	163,766,944	5,282,776
September	254,040,351	8,488,012	143,989,716	4,798,057
October	251,846,353	8,124,776	144,106,150	4,651,489
November	234,127,879	7,804,293	146,290,240	4,876,007
December	258,708,476	8,348,540	156,134,130	5,036,583
January	240,840,892	9,059,383	155,841,948	5,025,321
February	283,767,942	9,285,102	172,489,238	5,965,140
March	293,255,463	9,459,853	191,323,550	6,171,728
April	265,201,739	8,840,057	177,043,780	5,901,446
Totals	3,163,769,312		1,994,070,818	
Averages	963,447,442	8,644,178	166,172,552	5,448,280

	Total gallons pumped per month	Average gallons pumped per day
May	415,028,371	13,388,012
June	437,621,323	14,584,044
July	449,790,441	14,509,369
August	445,909,258	14,384,170
September	398,000,967	13,266,669
October	396,042,503	12,775,565
November	380,408,119	12,680,270
December	414,932,606	13,384,923
January	436,625,830	14,084,704
February	456,757,280	15,750,251
March	484,579,012	15,631,581
April	442,245,119	14,741,503
Totals	5,157,839,480	
Averages	429,819,994	14,092,458

CITY REPAIR SHOPS.

REPORT FOR THE YEAR ENDING APRIL 30 1934.

Total pay roll for the year.....	\$ 19,006 95
Average pay roll for the month	1,583 91
Average pay roll per day.....	51 93

The wages were distributed as follows:

Meters set.....	508	
Patent meter boxes set	239	
Concrete meter boxes set.....	8	
Wooden meter boxes set.....	50	
Total cost.....		\$ 1,295 02
Meters taken out.....	134	
Meters reset.	63	
Meters repaired.....	680	
Meters packed to prevent freezing.....	92	
Meters put in scrap	15	
Patent meter boxes repaired.....	33	
Patent meter boxes taken out	1	
Concrete meter boxes repaired.....	1	
Concrete meter boxes moved.....	1	
Wooden meter boxes repaired	1	
Total cost.....		\$ 1,024 81
Meters read.....	2	
Total cost.....		\$ 1 33
Services forced out.....	108	
Services inspected.....	98	
Services repaired.....	8	
Services turned on.....	60	
Services turned on.....	62	
Services turned off at main	3	
Service fixtures capped.....	2	
Service fixtures uncapped.....	1	
Service boxes repaired.....	6	
Services made (Street Opening Fund).....	383	
¼ inch taps made.....	160	
¾ inch taps made.....	155	
¾ inch taps made.....	18	
1 inch taps made.....	21	
¾ inch retaps made	91	
¾ inch retaps made.....	41	
¾ inch retaps made.....	27	
Total cost.....		\$ 1,353 78
Fire hydrants thawed out.....	441	
Fire hydrants pumped out	835	
Fire hydrant repaired.....	220	
Fire hydrants moved.....	17	
Total cost.....		\$ 1,762 64

Sprinkling cranes erected.....	13	
Sprinkling cranes taken down.....	21	
Sprinkling cranes repaired.....	16	
Total cost.....	\$	66 16
Special connection made (fire protection).....	8	
Total cost.....	\$	168 13
Street valves placed.....	13	
Street valves repaired.....	21	
Street valve boxes repaired.....	14	
Total cost.....	\$	131 06
Leaks in mains repaired.....	477	
Mains thawed out.....	14	
Total cost.....	\$	5,008 22
Superintendent's salary.....		1,203 92
Clerk's salary.....		237 11
Labor on new water mains.....		746 38
Labor at reservoir.....		448 49
Labor on tell-tale from reservoir.....		880 85
Labor on intake.....		172 01
Labor at stables.....		386 08
Labor at shops and storeroom.....		1,460 74
Labor furnished at lighting plant (repairs).....		1,009 85
Labor furnished at pumping station (repairs).....		1,189 47
Labor furnished road roller fund (repairs).....		302 54
Labor furnished water works extension (testing mains).....		158 74
Total pay roll for the year.....	\$	19 006 96

REPORT OF CITY ENGINEER.

GRAND RAPIDS, MICH., May 1st, 1904.

To the Honorable Board of Public Works:

GENTLEMEN—Herewith is presented the annual report of the work done by the Engineering Department during the fiscal year ending April 30th, 1904:

STREETS.

Profiles have been prepared and grade lines established upon streets and alleys to a total length of .863 of a mile during the year. 1.28 miles of streets have been added to the total mileage of 284.983 reported a year ago. 171.726 miles have been improved, leaving 114.537 miles, or about 40 per cent. of the total mileage still unimproved.

Grades have been re-established during the year on 2.7 miles of streets. The streets or alleys, extent and length of each, upon which grades have been established or re-established, are given in the tables below.

GRADE LINES ESTABLISHED.

STREET	EXTENT	Length in feet
Sheridan Avenue.....	Caulfield's sub-div. to north line Rumsey's add....	280
Earldon.	Cherry to Lake Avenue.....	354
Cherry Alley.....	South Diamond, west	105
Thirteenth.....	White to Station 15.....	750
South Lafayette Alley.....	Hall to Garden	1529
Martha.....	Godfrey Avenue to west end	275
Curve	Godfrey Avenue, west to R'y.....	460
Morris Avenue.....	Logan to Pleasant.....	804

4557 feet or .863 mile.

RE-ESTABLISHED.

STREET	EXTENT	Length in feet
Hughart Avenue	Caulfield to Sheridan Avenues	344
Briggs Avenue	Caulfield to Sheridan Avenues ..	253
Pearl Alley	Campau to Grand River	300
Campau Alley	Pearl Alley to Louis ...	260
Garden	South Division to Jefferson Avenue	919
Frances Avenue	Burton to Dickinson Avenues	1850
Horton Avenue	Burton to Crofton Avenue	2937
Ford	Brenner Court to Curtis	428
Brenner Court	North Avenue to North College Avenue	597
Sheridan Avenue	Half to north line Caulfield's sub division	1574
Dayton	South Lane Avenue to Big Ditch	1265
South Front	West Fulton to Wealthy Avenue	3020
Dewey	Fourth to Fifth	335
Logan	South Fuller to Bemis Avenue	603

14255 feet or 2 7 miles.

STREET IMPROVEMENTS.

Street improvement bonds to the extent of \$150,000 were issued during the year. Contrary to conditions existing for many years past, nearly all work contracted for had been completed during the working season of 1902. This would have permitted work being pushed to a prompt completion during 1903, but for the fact that the vote on the water works extension bonds was made so late that contracts for the pipe could not be closed in time to secure the first shipments of pipe before the middle of the summer. Many improvements were delayed for months; work on others was very seriously delayed, notably Ottawa street.

The small amount of work remaining unfinished from the preceding year, left little for the rollers to do during the first three months of the working season. Under proper conditions, the rollers should have been used to repair streets, but at this time the season's work of the Highway Commis-

sioner had not been determined, and there was no demand for roller repairs until later in the season.

The improvements, with few exceptions, were screened gravel with vertical curb and brick gutters, or brick on concrete. The only exception being Turner street north of the Grand Trunk Railway, where the curb and brick gutters were omitted, Charles street, paved with macadam, and North Lafayette street paved with bituminous macadam. Nelsonville blocks were used on Wealthy avenue from Division street to East street, and Ottawa street from Lyon street to Monroe street. Harris Pavers were used on State street; Wealthy Ave., from East street to Eureka Ave.; Commerce Alley, and City Hall Alley. The Trimble Blocks were used on West Fulton street and Turner street.

It is to be regretted that reasonable prices for a sheet asphalt pavement could not have been secured on State street, as most of the intersecting streets are paved with asphalt.

One small contract was let for bituminous macadam too late in the season for the work to be completed. It is to be hoped that an improvement can be secured that will lead to extensive use of this form of pavement under similar conditions. The improvement of Turner street where separation of grades with the D., G. H. & M. Ry. was secured, was finally undertaken by day labor after twice rejecting bids that seemed unreasonably high. When work was suspended in 1903, but little remained to be done and a saving of about \$1,500.00 would have been made. The work was planned one and one-half feet above previous high water marks. The extreme high water of March, 1904, went three and one-half feet above previous records, permitting the river to very seriously damage the work previously completed. The work completed and the new work contracted for during the past year is shown in the following tables:

WORK LEFT OVER FROM 1902 COMPLETED IN 1903.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	DIMENSIONS			COST		CONTRACTORS
		Width of Road	Length of Street	No of Square Yards	Amount of Contract Price	Amount Paid on Contract	
Wealthy Avenue	Division to East	42	4,928	old	\$2,670	\$41,545 00	J. McDermott & Son
GRADED, GRAVELED AND GUTTERS PAVED							
Cass Avenue	Hall to Garden.	30	1,329	3,128	4,850 00	5 160 00	J. McDermott & Son
Warden.	Winsor Place to Winsor Avenue	30	918	1,718	8 062 00	4 302 00	D W Boyes

WORK LET FROM MAY 1, 1903. TO MAY 1, 1904
PAVED WITH BRICK ON CONCRETE FOUNDATION

†State	Jefferson to Madison Avenue	42	1,454	old	7,390	16,090 00	16 388 00	Klaote & Vander Veer
‡Ottawa	Lyon to Monroe	38 to 53	735	old	3,477	3,010 00	3,024 00	J McDermott & Son
Commerce Alley	East Fulton to Cherry	20	1,220	1 542	2,433	5 660 00	5 802 00	J H Sullivan
‡West Fulton	Grand River to Jefferson	42	1,819	old	8 230	19,349 00	19 790 00	J McDermott & Son
Wealthy Avenue	South East to Eureka Avenue	42	654	old	3,190	6,054 00	6,290 00	L Schnelder
NOT COMPLETED								
‡City Hall Alley.	Ottawa to Ionic	23	224	349	722	1 514 44	1,631 00	J. H Sullivan
Turner	700 to 900 feet north of North	36	300	400	800		4,805 10	City
‡Grandville Ave.	Bartlett to Hall	42	5 021	old	31,550	62,500 10	63,200 00	J McDermott & Son
Ellsworth Avenue	Wealthy Ave to 300 ft s of Fulton	60	2 393	4,460	10,300	35,287 00	35 867 00	A Prange

GRADED, GRAVELED AND GUTTERS PAVED.

STREETS	EXTENT	DIMENSIONS				COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll		
Ann.	Canal to Plainfield.....	30	2 892	5,516	.....	9,944 00	10,344 00	.....	Kloote & Vander Veen
Dale Avenue.....	Canal to North Colt Avenue.....	30	1,527	2,958	.....	5,933 00	6,270 00	.....	Kloote & Vander Veen
Fairbanks.....	North Prospect to North Lafayette.	30	263	600	.....	1,590 00	1,740 00	.....	James B. Hoey
NOT COMPLETED.									
Twelfth.....	McReynolds to Tamarac.....	30	1,579	3,288	.....	7,570 00	7,920 00	3,375 00	D W. Boyes
Widdicomb.....	Twelfth to West Leonard.....	30	617	1,306	.....	2,751 00	2,970 00	1,986 00	D. W. Boyes
Fremont.....	Twelfth to West Leonard.....	30	617	1,306	.....	2,500 00	2,720 00	1,226 00	Richard Pickett
Madison Avenue..	Umatilla to Fifth Avenue.....	30	2,444	4,802	.....	8,440 00	8,890 00	7,472 00	Kloote & Vander Veen
Lake Avenue.	Wealthy Avenue to City Limits	30	614	1,072	.....	3,468 00	3,690 00	1,276 00	Gilner & Schnelder
Rural.....	Lake Avenue to Sherman.....	28	980	1,126	.....	4,255 00	4,555 00	1,421 00	Gilner & Schnelder
Fifth Avenue.....	Kalamazoo to Neland Avenue.....	42	816	1,608	.....	3,300 00	3,500 00	.....	Kloote & Vander Veen
Fifth Avenue.....	Neland to Giddings Avenue.....	42	3,340	4,514	.....	15,094 00	15,544 00	.....	Kloote & Vander Veen
West Division....	West Bridge to Shawmut Avenue ..	16	1,579	2,883	.....	4,730 00	5,030 00	2,790 00	Andrew Doyle
South Fuller.....	Wealthy Avenue to Sherman.....	30	1,320	2,348	.....	5,976 00	6,256 00	1,547 00	Andrew Doyle
Turner	North to 700 feet north	36	700	1,452	.....	7,200 00	7,445 00	3,640 00	Richard Pickett
Carleton Avenue..	Lake Avenue to East Fulton.....	30	1 755	3,356	.....	11,450 00	11,800 00	.....	Kloote & Vander Veen
Seward.....	West Bridge to First.....	16	377	783	.....	1,372 00	1,520 00	264 00	Andrew Doyle

NOT COMPLETED. CONTINUED

STREETS	EXTENT	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
		Width of Roadway	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll	
Buckeye	South Diamond to Calkins Avenue	30	656	2,369		5,975 00	6,200 00	Kloote & Vander Veen
Carroll Avenue	Lake Avenue to Buckeye	30	842					
Baldwin	Packard to Dwight Avenue	24	984	1,851		3,745 00	3,060 00	Kloote & Vander Veen
Morris Avenue	Logan to Pleasant	30	834	1,544			3,775 00	City
Madison Avenue	Unionville to Hall	36	140	146		680 00	810 00	Kloote & Vander Veen
Sheridan Avenue	Hall Street north	30	1,853	3,701		7,945 00	8,285 10	Gilmer & Schneider
Packard	East Fulton to Lake Avenue	30	382	839		1,855 00	2,025 10	James Sherlock
Turner	900 feet north of North to city line	30	1,734	None		5,329 00	5,539 00	Richard Pickett
Dayton	South Lane to Marion	30	667	None		1,940 00	2,110 00	W. D. Hembling
White	Leonard to Walker ..	30	1,192	None		3,100 00	3,325 50	W. D. Hembling
MACADAM								
Charles.	Cherry to Wealthy Avenue	30	1,361	2,714		6,374 00	6,750 00	Kloote & Vander Veen
BITUMINOUS MACADAM Not Completed								
North Lafayette	East Fulton to Fountain	28	756	1,477	2,180	8,249 00	6,420 00	A. C. Sekell

* Graded and Graveled + To replace sheet asphalt ; To replace cedar blocks
 NOTE—Cost of Morris Avenue Improvement and Turner Street subway, approximate.

MILEAGE OF STREETS.

The mileage of streets in the city, and the length of each class of improvements are shown in the following table:

Graded and paved with sheet asphalt.....	6.150
Graded and paved with block asphalt on gravel foundation .....	.683
Graded and paved with block asphalt on concrete ....	.230
Graded and paved with brick on concrete	8.637
Graded and macadamized	6.272
Graded and paved with tar concrete....	.341
Graded and paved with cedar blocks on concrete....	4.694
Graded and paved with cedar blocks on plank. ....	.184
Graded and paved with cedar blocks on gravel.....	1.931
Graded and paved with cedar blocks and cobble stones. ..	1.838
Graded and paved with Portland cement concrete. ....	.187
Graded and paved with cobble stones on gravel .....	.755
Graded, graveled and gutters paved with cobble stones.	83.069
Graded, graveled and gutters paved with brick....	27.181
Graded and graveled....	29.654
Unimproved....	114.537
Total....	296.263

ROAD ROLLERS.

Rolling with the steam roller began April 3rd, 1903. The work was suspended suddenly by the early fall of snow, which stalled all but one of the rollers. For the first few months three of the rollers worked short hours. The Harrisburg roller was not started for several weeks after the opening of the season.

The cost of maintenance and operation of the rollers is given below.

All but the Harrisburg roller were thoroughly overhauled and repaired, more being necessary on the Russell on account of such thorough repairs not having seemed necessary the preceding year.

Proposals for a new roller were received as given below and a contract was finally made for a Kelly-Springfield roller of the 26,000 pound class.

BIDS ON ROLLERS.

ITEMS	American Road Roller Co.	Kelly-Spring- field Road Roller Co.	Julian Scholl & Co.
Price F O B, Grand Rapids	\$ 3 160 00	\$ 3 380 00	\$ 3 400 00
Allow for Harrisburg	1,250 00	1,500 00	1,500 00
Net price	1 910 00	1,880 00	1,900 00
Net weight pounds	25,000 00	26,000 00	24,000 00

A new steering engine of improved design for the No. 1 Kelly was included in the proposition of the Kelly-Springfield Company.

The maintenance and operation is itemized as follows: -

NO. 1 KELLY ROLLER

Maintenance—	Wages	\$ 115 67
	Parts and miscellaneous	70 27
Operation—	Wages	635 47
	Coal and kindling	307 42
	Supplies	25 71
	Total	\$1 154 14

NO. 2 HARRISBURG ROLLER.

Maintenance—	Wages	\$ 37 44
	Parts and miscellaneous	36 17
Operation—	Wages	3,8 55
	Coal and kindling	239 49
	Supplies	29 03
	Total	\$ 702 68

Was used only part of the season and no repairs were made during the winter on account of exchange

NO. 3 RUSSELL ROLLER.

Maintenance—	Wages	\$ 114 88
	Parts and miscellaneous	376 31
Operation—	Wages	634 27
	Coal and kindling	244 72
	Supplies	38 40
	Total	\$1,405 68

NO. 4 HEISLER UNIVERSAL ROLLER

Maintenance—	Wages	\$ 123 72
	Parts and miscellaneous	192 68
Operation—	Wages	594 00
	Coal and kindling	196 45
	Supplies	23 25
	Total	\$1,140 10

SEWERS.

All sewer work was confined to sewers of 24 inches and less in diameter, with the exception of the B street system. The sewers were in small contracts and were laid where street improvements were to be made or to accommodate small and well built up sections. The flood so unsettled conditions on the West Side as to make it desirable to postpone the proposed West Side ditch sewer. This can be but temporary as there is a very pressing demand for the sewer in all sections of the district drained.

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING APRIL 30, 1904.

The table following gives the location, kind and cost of sewers constructed during the year

STREET	EXTENT	KINDS			COST			CONTRACTORS	
		Inches	Length		Manholes	Catch Basins	Contract Price		Amount of Roll
			Vitrified Pipe	Storm						Sanitary and Combined
Lake Avenue	Wealthy Avenue to east city limits	12	430	607	3	...	...	Peter Van Ess
Rural ..	Lake Avenue to Sherman	8	410	994	4	1,714 00	1,934 30	Peter Van Ess	
South Pine	Jackson to Chatham.	8	...	215	2	250 00	282 00	Van Ess & Heerschap	
Indiana ..	Jackson to Bowery ..	8	...	476	4	...	673 00	City	
South Union ..	Wealthy Avenue, north.	8	...	346	1	320 00	370 00	Van Ess & Heerschap	
Grandville Avenue	Hughart to north of Martha	8	...	681	3	675 00	810 00	Peter Van Ess	
Eighth Avenue ...	South Iowa to Agnew Avenue	8	...	302	2	809 00	974 00	Peter Van Ess	
Agnew Avenue	Eighth to Ninth Avenues. ...	8	...	311	1	...	...	Peter Van Ess
Ney	South Market to Goodrich	8	...	300	2	...	336 56	City	
Second ...	Lincoln to Fremont.	12	...	421	6	...	...	Van Ess & Heerschap
North Pine ..	Second to Third	8	...	1816	...	2,080 00	2,996 00	Van Ess & Heerschap	
North Lane Avenue	Second to Third..	8	...	240	1	...	...	James B Hoey
Seward ..	West Bridge to First ..	8	...	273	1	463 00	678 00	James B Hoey	
Ellsworth Avenue	Goodrich to Wealthy	8	...	340	2	372 00	...	A Prange	
North Lafayette...	East Fulton to Fountain	8	...	278	2	592 00	727 00	A. C. Seckell	
East Leonard	Canal to Taylor. ...	8	.....	653	2	850 00	990 00	Peter Van Ess
		8	.....	404	3	...	...	Peter Van Ess

The above noted sewer work cost \$33,295.

The work of the season increases the sewer system 4.746 miles.

The length of sewers of the city are as follows:

Combined	119,128
Separate system, Sanitary	12,726
Storm	11,619

Composed of the following:

Brick	23,093
Vitrified pipe	118,120
Cement pip.	100
Wrought iron pipe	160
Cast iron pipe	324
Concrete sewer	1,392
Concrete brick	394
Total	143,473

In connection with this system there are 2,434 manholes.

BRIDGES.

Practically all bridge work during the season was confined to the piers and abutments of Bridge street and Wealthy avenue bridges.

BRIDGE STREET BRIDGE.

April 17, 1903, plans and specifications for a concrete and a concrete-steel bridge were approved. Bids were received June 5, 1903, and contract was awarded to Joseph P. Rusche for \$87,400 for the concrete-steel construction. An agreement was made with the Concrete Steel Engineering Company of New York for the use of their patents, a fee of \$2,500 being paid for royalty and dimension plans. Work was commenced soon after the execution of the contract and was executed in an energetic manner, the piers and abutments being completed to above the springing line before cold weather made necessary the suspension of work.

Plans had subsequently been approved for concrete-steel retaining walls between the west abutment and the West Side canal. This work was executed by Mr. Rusche as an extra. The construction of the retaining walls permitted

the street being filled to the bottom of the trusses of the old bridge. The cost of the work to date is given below.

ON MAIN BRIDGE TO MAY 1, 1904.

Paid on contract.....	\$ 36,542 00
Extras.....	46 34
Engineering.....	129 00
Inspection.....	465 30
Printing.....	151 40
Royalty.....	1,250 00
Total.....	\$ 38,584 04

BRIDGE STREET BRIDGE APPROACHES.

Previous to May 1, 1903.....	\$ 973 39
Teams and filling.....	\$ 141 30
Labor filling.....	220 28
Steel for reinforcing concrete.....	211 53
Labor and material on concrete, including lumber for form.....	1,778 57
Total year ending May 1, 1904.....	2,351 68
Total to date.....	3,325 07

There was also spent in keeping the old bridge in repair over the winter as follows:

Labor.....	\$ 48 42
Tools.....	3 35
Planking.....	70 09
Paint used on spans removed.....	33 00
Total.....	154 86

WEALTHY AVENUE BRIDGE.

As stated in the last annual report, the contract for the substructure of Wealthy avenue bridge was awarded to James Higgins. Work was commenced on the east abutment during the fall of 1902. Lack of proper equipment and unusually high water so delayed the work that when the excavation had reached a point about four feet above the required depth and considerable water was encountered, the contractor abandoned the work. After considerable delay due to readvertising and the efforts of the bondsmen to make arrangements for continuing the work, it was turned over to this department to complete. This was about the first of July. By the time proper equipment could be secured and

the work organized, the exceptionally wet summer season had begun, making it necessary to carry on the work with from four to five feet more water than customary at that time of the year. Considerable of the work was completed during the winter, which added considerably to the expense. Work on the west abutment was not commenced until after high water of 1904. The total cost of the work for the year is given below.

Higgins contract	\$17,577 83
Engineering	73 00
Inspection	39 55
	<hr/>
	\$17,689 88
There had previously been spent for the east approach	\$1,348 01
Filling during 1903-4	10 90
	<hr/>
Total to date	\$1 358 91

Work on the east approach has been suspended, pending the decision of the Supreme Court on the McKee case.

SUPERSTRUCTURE.

Plans and specifications for the superstructure were approved Jan. 23, 1904. Bids were received and the contract awarded to the Milwaukee Bridge Co. for \$31,558.

The superstructure consists of a fixed span of 180 feet and a draw span of 234 feet, trusses 24 feet centers, with two six foot sidewalks. The superstructure is designed for paved roadway and concrete sidewalks, and heavy electric cars.

WATER WORKS.

The favorable vote of the people on issuing \$170,000 of bonds for extending and reinforcing the water works system, together with the better financial condition of the water works fund, made possible the laying of a considerable mileage of large, reinforcing mains, as well as smaller supply mains. The previous policy of laying mains in streets being improved was again made possible.

The vote on the bond issue was so late that the summer

was well advanced before pipe could be secured to commence work and considerable remained above ground during the winter.

Large, reinforcing mains were laid in Broadway and North streets, West Fulton street, Ottawa street and Fuller street. The remainder of the work consisted mostly of small distributing mains. Below are given the mains laid during the year. All work was done by contract unless otherwise noted. A table below gives total miles of pipe in the Water Works System prior to May 1, 1903, the amount laid during 1903, and the total miles to date.

MILES.

	4 in.	6 in.	8 in.	10 in.		14 in.	16 in.	8 in.	20 in.		30 in.	36 in.	Hy- drants	Valves
Prior to 1903..	40 556	54 754	20 000	6 232	14 411	0 239	5 637	0 749	1 724	1 645	.05	.019	1 371	1 250
Laid in 1903...	.....	2.	.123	.813	312	.....	.451	.....	.129	.015	.....	.....	33	74
Totals.....	40 556	56 754	19 811	7 045	14 723	0 239	6 088	0 749	1 853	1 660	.00	.019	1 404	1 324

NOTE:—312 miles of 8 in pipe removed.

PERMITS FOR OPENING STREETS.

Beginning with the fiscal year, all new sewer and water connection, and all work in connection with the maintenance and repair of the same in the public streets, has been made by this department. This plan was suggested by a committee of the Master Plumbers' Association and after careful consideration adopted by the Board. A communication suggesting its adoption was approved by the Common Council March 9, 1903. Briefly outlined, the plan is as follows:

An owner desiring work done makes application at this office. An approximate estimate of the cost of the work is made, the amount of which is deposited with the City Treasurer. This amount stands to the credit of the owner; creates a working fund, and obviates the employment of collectors. Upon the completion of the work an itemized statement of the actual cost of labor and material, together with a percentage sufficient to meet the expenses of conducting the work, is sent the owner. Should the deposit exceed the cost, the difference is returned. Should the cost exceed the deposit, a bill for the difference is rendered.

Up to the present, the plan is not satisfactory to a majority of the people for whom work has been done, nor has it been conducted in a manner to meet the expectation of the department. The work started in the midst of a very busy season with men unfamiliar with our methods of conducting the work and the various forms of reports necessary to properly keep our records. Some of the best workmen could not properly report labor and materials. Others would not work where subjected to the very common fault finding on the part of the property owner. Several of the plumbing firms have given us their hearty support. Many have placed all possible obstacles in our way. During the latter part of the season the work had become better organized and the results more satisfactory, but the extreme and long continued cold winter caused an unexpected and unpre-

cedented large amount of work, both in thawing services and in repairing leaks. It was impossible to secure at once sufficient skilled men to meet the demands, and it was necessary to call upon the plumbers in a large number of cases. It was impossible to properly replace the streets when the backfilling was frozen. This necessitated repeated repairs to the trenches to prevent injuries, until such time as permanent repairs could be made.

The whole year's work has been conducted, seemingly, under the most unfavorable conditions; all employes in charge have worked hard and faithfully; everybody is dissatisfied.

The total number of orders for the year is 1,073.

For sewer connections	135
For water connections	156
For both sewer and water connections	218
For thawing water services	914
For miscellaneous repairs	350
Total	1,073

The disbursements were as follows:

Expense-- Office	\$ 83 00
Superintendent.	949 29
Teaming	691 71
Tool house	560 84
Tools	537 51
Miscellaneous	476 09
	\$ 3,219 04
Merchandise .	\$ 6,810 33
Labor	9,832 04
Plumbing, etc	465 40
	\$20,316 81

The total receipts for the year amounted to \$20,724.72 and the disbursements \$20,316.81, leaving a balance in the fund of \$407.91.

Corporations having franchise rights have been required to take out permits as heretofore, plans showing the proposed work being submitted. Such work was inspected and the costs collected.

GAGING OF GRAND RIVER.

The following table shows the daily water levels at Fulton street bridge during the past year. All elevations refer to city datum. It will be noted that the water reached an elevation of 19.2 on the 27th of March, 1904, which exceeds any previous record back to 1832, when an elevation of about 18.8 was reached, as near as can be determined from information available.

It is to be regretted that a current meter was not available for making careful velocity readings, to check the discharge curve as determined from the readings of 1901, and to extend the same for the higher elevations. Such information would have been of considerable value in investigating methods for preventing a repetition of similar conditions. Elevations were carefully taken at varying stages of the river and such other information secured as possible with the equipment at hand.

DAY	May 1903	June	July	August	September	October	November	December	January 1904	February	March	April
1	2.55	0.90	0.83	0.10	3.35	3.86	0.75	0.55	1.60	2.35	2.25	14.45
2	2.15	0.75	0.75		3.30	3.65	0.60	0.35	1.60	1.95	2.35	13.67
3	..	0.65	0.60	0.15	3.10	4.10	0.55	0.35		2.10	2.80	
4	1.80	0.45		0.05	2.75	4.55	0.55	0.40	1.90	2.25	3.55	12.85
5	1.60	0.30		0.30	2.30	3.70	0.45	0.35	1.60	2.15	4.50	12.08
6	1.50	0.20	0.73	0.45	2.60	4.20	0.45	...	1.60	2.20		11.20
7	1.40		0.55	0.55	1.90	4.95	0.45	0.45	1.55		6.33	10.50
8	1.20	0.18	0.35	0.60	1.70	4.60	...	0.30	1.25	2.47	7.40	9.55
9	1.10	0.18	0.30		1.60	4.25	0.43	0.30	1.40	3.37	6.25	9.40
10		0.25	0.30	0.50	1.80	4.40	0.42	0.40	..	3.47	9.23	
11	0.90	0.40	0.00	0.35	2.05	4.00	0.35	0.40	1.45	4.35	10.95	8.70
12	0.80	0.30		0.20	2.00	3.73	0.45	0.25	1.45	4.35	12.05	8.60
13	0.79	0.05	0.25	0.10	1.75	3.30	0.45	..	1.85	4.23	...	8.28
14	0.75	..	0.15	0.05	1.60	2.95	0.55	1.33	1.40		12.40	7.85
15	0.60	0.05	0.30	0.10	1.40	2.75		1.05	1.30	3.80	12.15	7.33
16	0.55	0.12	0.55		1.30	2.85	0.85	1.05	1.80	3.70	11.70	6.83
17	...	0.07	0.45	0.30	1.50	2.60	0.95	1.10	..	3.55	11.30	
18	0.40	0.15	0.00	0.25	1.90	2.25	0.95	0.90	1.40	3.35	10.75	6.20
19	0.40	0.15	..	0.35	2.00	2.15	0.95	1.10	1.50	3.00	10.10	6.15
20	0.30	0.08	0.30	0.25	2.05	1.95	0.93	..	1.45	2.80		6.15
21	0.30	...	0.35	0.40	2.20	1.80	0.90	0.95	1.35	..	9.15	6.00
22	0.55	0.35	0.45	0.40	2.65	1.65		0.85	1.45	2.60	9.30	5.68
23	0.55	0.90	0.50	...	3.60	1.35	0.65	0.75	1.60	2.55	10.67	5.25
24		1.30	0.50	0.00	3.70	1.25	0.75	0.80		2.45	11.45	
25	0.65	1.50	0.40	0.35	3.55	1.05	0.70	1.10	2.30	2.45	16.43	4.65
26	0.88	1.80		0.45	3.35	1.05	0.15	1.40	2.25	2.45	18.10	4.37
27	1.60	1.55	0.30	0.70	2.85	1.05	0.30	..	2.15	2.45	19.20	4.00
28	1.88	..	0.10	2.40	2.70	1.05	0.20	1.75	2.15		19.20	3.75
29	1.70	1.15	0.37	2.25	3.73	0.95	...	1.80	2.25	2.25	18.13	3.53
30	1.45	0.87	0.15	..	3.50	0.85	0.55	1.70	2.25		16.75	3.15
31	...	...	0.10	3.25	...	0.80	...	1.65	..		15.40	

COST OF PUBLIC IMPROVEMENTS.

The cost of the work executed during the year is as follows:

Cost of street improvements \$311,461.00, upon which has been paid.....	\$ 35,901 00
Paid in settlement of old work.....	46,924 00
Cost of sewers.....	33,296 56
Cost of bridge repairs.....	154 86
Cost of new bridges.....	58,739 03
Water works extensions, mains.....	42,859 78
Total.....	\$217,874 23

EXPENSES.

The expenses of the department are shown below.

Salaries (charge to general fund).....	\$ 7,751 78
Salaries (charge to special improvements).....	3,498 00
Inspection	5,995 11
Postage and express.....	43 01
Library	26 55
Printing.....	74 60
Telephones and Telegraph.....	26 63
Stationery	69 83
Typewriter supplies.....	13 95
Blue print and tracing.....	74 03
Maps.....	50
Car fare.....	235 00
Livery (single rig).....	257 75
Miscellaneous repairs.....	33 89
Miscellaneous supplies.....	75 13
	\$17,475 76

The natural increase of work under this department together with the large amount of special work on which estimates have been requested, ordered or under way, has exceeded the capacity of the present force. The new offices, now occupied by the library, will furnish much needed room for systematizing the work and increasing the help as the necessities of the work demand.

Respectfully submitted,

L. W. ANDERSON,
City Engineer.



1911

Board of Public Works

TO THE

COMMON COUNCIL

OF THE CITY OF

Grand Rapids, Michigan.

PRESENTED TO THE BOARD OF THE GENERAL ENGINEERING
AND CITY ENGINEER, GEORGE A. BEECHER, FOR THE
CASHIER

1911



THIRTY-SECOND
ANNUAL REPORT
OF THE
Board of Public Works
TO THE
COMMON COUNCIL
OF THE CITY OF
Grand Rapids, Michigan.

**TRANSMITTING THE REPORTS OF THE GENERAL SUPERIN-
TENDENT, CITY ENGINEER, CLERK, CHIEF INSPECTOR AND
CASHIER.**

FOR THE
YEAR ENDING APRIL 15th, 1905.

GRAND RAPIDS, MICHIGAN.
WEST MICHIGAN PRINTING CO., 1905.

112

1751

PAST AND PRESENT OFFICERS

OF THE

BOARD OF PUBLIC WORKS.

PRESIDENTS.

Thomas D. Gilbert.....April, 1873, to May, 1878.
James Miller.....May, 1878, to November, 1879
George W. Thayer.....November 1879, to May, 1888.
George G. Briggs.....May 1888, to May, 1890.
James N. Davis.....May 1890, to May, 1892.
William R. ShelbyMay 1892, to May 1893.
Frances Letellier.....May, 1893, to May, 1896.
C. G. SwensburgMay, 1896, to October, 1897.
Enos Putman.....October, 1897, to January 1898
Dudley E. Waters.....January, 1898, to May, 1898.
William T. Johnson.....May, 1898, to May, 1899.
Dudley E. WatersMay, 1899, to May, 1901.
Orson A. BallMay, 1901, to May, 1902.
Joseph Emmer.....May 1902, to May, 1903.
James E. Keegan.....May, 1903 to May, 1904.
John Rowson.....May, 1904, to May, 1905.

CLERKS.

A. M. Warrell... ..April, 1873, to August, 1875.
A. B. Farnsworth.....August, 1875, to Feb., 1878.
Fred A. Twamley.....February, 1878, to May, 1900.
Will J. Sproat.....May, 1900, to July, 1902.
John C. BrownJuly, 1902, to April 1, 1905.

CITY ENGINEERS.

E. W. Muencher.....April, 1873, to May, 1877.
 A. C. Sekell.....May, 1877, to May, 1883.
 H. A. Collar.....May, 1883, to October, 1896.
 Geo. M. Ames (acting)..October, 1896, to March, 1898
 Geo. M. Ames.....March, 1898, to May, 1900.
 L. W. Anderson (acting).May, 1900, to May, 1901.
 L. W. AndersonMay 1901 to

ENGINEERS OF PUMPING STATION.

Demetrius Turner..... May, 1874, to May, 1884.
 Geo. E. Kirk.....May, 1884, to July 21, 1892.
 E. A. Bates.....July, 1892, to April, 1900.
 Barney Meyer..... ..April, 1900, to May, 1905.

SUPERINTENDENT OF PUMPING AND LIGHTING STATIONS.

John L. ShawJuly, 1899, to March 18, 1900.
 Barney MeyerApril, 1900, to May, 1905.

SUPERINTENDENT OF REPAIRS AND CONSTRUCTIONS.

Thomas Farmer, jr.....May, 1878, to May, 1880.
 A. C. Sekell.....May, 1880, to May, 1883.
 John Van AmbergMay, 1883, to May, 1900.

INSPECTOR OF WATER WASTE.

A. Per Lee.....July, 1885, to May, 1900.

CHIEF INSPECTOR.

Adolph WurzburgMay, 1900, to

BOARD OF PUBLIC WORKS,**MAY 1, 1905.**

John Rowson, President, Term expires May, 1905.
Edwin F. Sweet, Mayor Term expires May, 1906.
Edgar S. Kiefer Term expires May, 1905.
Maurice Shanahan Term expires May, 1906.
Samuel G. Braudy Term expires May, 1906.
Jas. E. Keegan Term expires May, 1907.

OFFICERS.

Barney Meyer General Superintendent
L. W. Anderson City Engineer.
John C. Brown (resigned April 1, 1905) Clerk.
Adolph Wurzburg Acting Clerk.
Adolph Wurzburg Chief Inspector.

REPORT OF THE BOARD OF PUBLIC WORKS.

GRAND RAPIDS, MICH., May, 1, 1905.

To the Honorable Common Council :

GENTLEMEN:—Herewith are transmitted annual reports from the departments of the municipal government under the control of this Board.

We would respectfully refer you to the report of the City Engineer for information relative to street improvements and the construction of sewers, bridges, laying water mains, etc.; to the reports of the General Superintendent for information in reference to the work of the lighting plant, the pumping station and the repair shops; to the Chief Inspector's report for information in reference to services and fixtures, and meters, and to the Clerk's report for information relative to the receipts and expenditures in the water works and lighting departments for the past year.

Respectfully submitted,

JOHN ROWSON, President.

EDGAR S. KIEFER,

MAURICE SHANAHAN,

SAMUEL G. BRAUDY,

JAS. E. KEEGAN,

EDWIN F. SWEET, Mayor.

CORRECTED BALANCES ON ANNUAL REPORTS
from April 30, 1901, to April 15, 1905,
AS PER AUDITORS' REPORT.

1901.

Total receipts for the year ending April 30, 1901, were.....	\$ 143,767 50
Overdraft (April 30, 1901).....	2,756 78
	<u>\$ 146,524 28</u>

The income of the department from the beginning of collec-	
tions May 1st, 1874, to May 1st, 1900, was.....	\$1,225,390 99
For the past year	113,576 67
Total income to date	<u>\$1,338,967 66</u>

CONSTRUCTION OF WATER WORKS.

Disbursements April 30, 1900, to April 30, 1901, were.....	\$ 15,713 79
Paid previous to May 1st, 1900.....	1,432,087 23
Total invested to date	<u>\$1,447,801 02</u>

RECAPITULATION.

Total disbursements for maintenance and operation	\$ 90,716 93
Interest and Exchange.....	39,261 96
Construction	15,713 79
Overdrafts of April 30, 1900.....	631 60
Transfer to petty cash account	200 00
	<u>\$146,524 28</u>

1902.

Total receipts for the year ending April 30, 1902,were	\$ 109,791 52
The income of the department from the beginning of collec-	
tions to May 1st, 1901, was.....	1,338,967 66
For the past year.....	109,791 52
Total income to date.....	<u>\$ 1,448,759 18</u>

CONSTRUCTION OF WATER WORKS.

Disbursements April 30, 1901, to April 30, 1902, were	\$ 14,353 68
Paid previous to May 1st, 1901.....	1,447,801 02
<hr/>	
Total invested to date.....	\$1,462,154 70

RECAPITULATION.

Total disbursements for maintenance and operation.....	\$ 52,153 10
Interest and exchange	39,261 96
Construction	14,353 68
Refunded water rates.....	145 56
Overdraft April 30, 1901.....	2,756 78
<hr/>	
Total disbursements	\$ 108,671 08
Cash on hand May 1st, 1902.....	1,120 44
<hr/>	
Total, equals receipts.....	\$ 109,791 52
Total paid for maintenance and operation previous to May 1, 1902	723,364 05
Paid during the past year.....	52,153 10
<hr/>	
Total to date	\$ 775,517 15

1903.

Total receipts for the year ending April 30, 1903, were.....	\$ 135,575 05
The income of the department from the beginning of collections to May 1st, 1902.....	1,448,759 18
For the past year.....	135,575 05
<hr/>	
Total income to date.....	\$ 1,584,334 23

CONSTRUCTION OF WATER WORKS.

Disbursements April 30, 1902, to April 30, 1903, were.....	\$ 37,219 27
Paid previous to May 1st, 1902.....	1,462,154 70
<hr/>	
Total investment to date.....	\$1,499,373 97

RECAPITULATION.

Total disbursements for maintenance and operation.....	\$ 55,694 16
Interest and exchange	39,206 24
Construction	37,219 27
Refunded water rates	152 58
<hr/>	
Total disbursements	\$132,272 25

CITY OF GRAND RAPIDS

9

Total paid for maintainance and operation previous to May	
1st. 1902	\$ 773,517 15
Paid during the past year	55,684 16
Total to date	\$ 831,211 31
Cash on hand May 1st, 1903.....	1,120 44
Receipts for the past year.....	135,575 05
Disbursements for the past year.....	132,272 25
Cash on hand May 1st, 1903.....	4,423 24
	<hr/>
	\$136,645 49 \$ 136,645 49

1904.

Total receipts for the year ending April 30, 1904, were.....	\$ 125,972 84
The income of the department from the beginning of collec-	
tions to May 1, 1903	1,584,834 23
For the past year.....	125,972 84
Total income to date.....	\$ 1,710,807 07

CONSTRUCTION OF WATER WORKS.

Disbursements from April 30, 1903, to April 30, 1904 were...	\$ 11,252 32
Paid previous to May 1st, 1903.....	1,490,373 97
Paid during past year (water works extention fund).....	60,719 57
Total investment to date.....	\$ 1,571,345 86

RECAPITULATION.

Total disbursements for maintenance and operation.....	\$ 76,474 38
Interest and exchange	39,203 24
Interest on water works extension bonds.....	1,400 00
Refunded water rates.....	180 20
Construction	11,252 32
Total disbursements.....	\$ 128,510 14
Total paid for maintenance and operation previous to May	
1st, 1903.....	\$ 831,211 31
Paid during the past year.....	76,474 38
Total to date	\$ 907,685 69

Cash on hand May 1st, 1903.....	\$ 4,423 24
Receipts for the past year	125,972 84
Disbursements for the past year.....	\$ 128,510 14
Cash on hand May 1st, 1904.....	1,885 94
	<hr/>
	\$130,896 08 \$180,396 08

CLERK'S ANNUAL REPORT.

OFFICE OF THE BOARD OF PUBLIC WORKS, }
GRAND RAPIDS, MICH., April 15, 1905.

To the Honorable Board of Public Works :

GENTLEMEN :—I respectfully submit to your Honorable body the following reports of the receipts of and the disbursements from the water works and public lighting funds for the fiscal year ending April 15, 1905.

WATER WORKS DEPARTMENT.

The receipts of the water works department for the year ending April 15, 1905, were as follows :

From water rates and fines	\$ 139,535 28
From water permits	2,082 50
From sale of labor and material.....	11,594 07
From plumbers' licenses.....	280 00
Accrued interest on water works extension bonds.....	589 91
Material sold by City Engineer.....	16 75
	<hr/>
Total income of water works fund.....	\$ 154,048 51
The total income of this department from the beginning of collections to May 1st, 1904, was.....	1,710,307 07
	<hr/>
Total income to date.....	\$ 1,864,355 58

DISBURSEMENTS.

CONSTRUCTION.

Extension of mains.....	\$ 11,885 26
New meters.....	8,612 41
Setting meters.....	6,588 27
Machinery	141 21
New water supply.....	27 85
	<hr/>
Total paid on construction account.....	\$ 27,250 00
Paid previous to May 1st, 1904	1,571,345 86
Paid during past year (water works extension fund).....	88,073 08
	<hr/>
Total investment to date.....	\$ 1,686,668 89

MAINTENANCE AND OPERATION.

1 PUMPING STATION.

Superintendence	\$ 1,827 00
Engineers	3,307 69
Firemen and coal passers... ..	5,311 20
Extra help	853 00
Buildings and grounds	166 96
Engines	917 57
Boilers	698 17
Auxiliary machinery..... ..	60 93
Coal	22,345 15
Oils	485 43
Waste	128 30
Supplies and tools	1,605 64
Miscellaneous	2,045 12
Total	\$ 39,812 06

2 DISTRIBUTION.

Repairing and lowering mains .. .	\$ 13,356 26
Reading meters..... ..	1,556 26
Repairing meters	3,375 64
Supplies and tools	1,772 35
Stables	1,083 73
Reservoir	21 45
Standpipe.	10 00
Fire hydrants	1,909 73
Sprinkling hydrants.	61 58
Valves	357 81
Services	8,498 40
Repair shop and store house .. .	1,514 63
Intake	4,464 18
Miscellaneous	33 75
Total	\$ 38,634 67

OFFICE.

One-fourth clerk's salary.....	\$ 343 75
Deputy clerk, bookkeeper, cashier and assistants .. .	2,500 75
Books, blanks and stationery .. .	524 98
Postage	64 84
Miscellaneous	335 94
Advertising..... ..	7 30
Total.	\$ 3,777 56

INSPECTORS

Chief inspector, three assistants, two meter readers and temporary meter readers.....	\$ 3,884 68
All supplies, etc., for the inspection department are charged to the office account.	

The closing of the fiscal year has been changed to April 1st. This report covers a period of 12 months.

RECAPITULATION.			
Pumping station	\$	39,812 06	
Distribution.....		33,634 67	
Office		3,777 56	
Inspectors		3,884 68	
		<hr/>	
Total for maintenance and operation	\$	86,108 97	
Construction.....		27,250 00	
Interest and exchange		41,799 24	
Refunded water rates.....		181 55	
		<hr/>	
Total disbursements	\$	155,339 76	
Total paid for maintenance and operation previous to May 1st, 1904 ..	\$	907,685 69	
Paid during the past year.....		86,108 97	
		<hr/>	
Total to date.....	\$	993,794 66	
Cash on hand May 1st, 1904.....	\$	1,885 94	
Receipts for the past year		154,048 51	
Disbursements past year.....	\$	155,339 76	
Cash on hand, April 15th, 1905.		594 69	
		<hr/>	
	\$	155,934 45	\$155,934 45

LIGHTING DEPARTMENT.

RECEIPTS.	
Budget appropriation, public lighting fund.....	\$ 27,500 00
Budget appropriation, extension fund.	3,000 00
Budget appropriation, repairing towers	500 00
City orders returned	24 27
Transferred from general fund, April 13, 1905.....	1,409 82
<hr/>	
Total Credits	\$ 32,434 09

DISBURSEMENTS.	
CONSTRUCTION AND EXTENSION.	
Lines and cables.....	\$ 1,540 51
Lamps and labor.....	1,459 49
<hr/>	
Total.....	\$ 3,000 00

MAINTENANCE AND OPERATION.	
1—STATION.	
Superintendence.....	\$ 565 46
Clerk.....	431 99
Engineers.....	2,136 81
Firemen, coal-passers and oilers.....	2,234 96
Dynamo tenders.....	1,217 17
Trimmers and linemen.....	3,066 92
Buildings and grounds.....	260 79
Engines.....	915 36
Boilers.....	193 59

Coal.....	\$ 9,147 85	
Oils	502 30	
Waste.....	155 33	
Dynamos.....	103 14	
Switchboard and connections.....	21 19	
Supplies and tools.....	1,247 42	
Repairs (city repair shop).....	1,401 34	
Miscellaneous.....	41 70	
Total.....		\$ 23,643 33

2—DISTRIBUTION.

Lines and cables.....	\$ 807 56	
Conduits.....	6 20	
Towers.....	565 90	
Lamps	1,081 87	
Globes	84 03	
Carbons.....	497 64	
Stables.....	377 67	
Miscellaneous	14 30	
Total.....		\$ 3,435 17

3—OFFICE.

One-fourth salary of secretary	\$ 343 75	
Miscellaneous	45 08	
Total.....		\$ 388 83

RECAPITULATION.

Construction and extension.....	\$ 3,000 00	
Station....	23,643 33	
Office.....	388 83	
Distribution.....	3,435 17	
Total maintenance and operation		\$ 27,467 33
Total disbursements		\$ 30,467 33
Overdraft, April 30, 1904.....		1,966 76
Total....equals receipts.....		\$ 32,434 09

NOTE—On April 13, 1905, the sum of \$1,409.82 was transferred from the General Fund to the Public Lighting Fund to balance the overdraft in this fund. This will be repaid to the General Fund from the Budget Appropriation to the Lighting Fund for 1905.

Total amount paid for construction previous to May 1st, 1904....	\$ 202,886 89	
Paid during the past year.....	3,000 00	
Total investment to date.....		\$ 205,886 89

The bonded indebtedness is \$125,000.00 and the interest and exchange for the past year amounted to \$5,007.00, the \$7.00 being for exchange and commission.

LIGHTING MUNICIPAL BUILDINGS FUND.

RECEIPTS.

Budget appropriation.....\$ 5,000 00

DISBURSEMENTS.

Advertising for engine and generator.....\$ 61 95
Copying specifications..... 1 75
Telegrams and stamps..... 64
Wiring city engineer's office..... 175 00

Total disbursements.....	\$	239 34
Balance in fund, April 15th, 1905.....		4,760 66
Total....equals receipts.....	\$	5,000 00

Respectfully submitted,
ADOLPH WURZBURG,
Acting Clerk.

WATER WORKS BONDS AND INTEREST.

Series	Due	Date of Issue	Date of Maturity	Com. and Ex.	Principal	Rate	Int. and Ex.	Total
Fourth	Sept. 1	September, 1888	September, 1908	7 50	150000 00	5 %	3757 50	7615 00
	March 1			7 50			3757 50	
Fifth	May 1	May, 1889		4 00	80000 00	5 %	2004 00	
	Nov. 1			4 00			2004 00	
Sixth	Jan. 1	January, 1892	January, 1912	13 50	300000 00	4½ %	6763 50	13627 00
	July			13 50			6763 50	
Refn'd	Oct. 1	October, 1893		10 12	225000 00	4½ %	5072 62	
First	Apr. 1			10 12			5072 62	
Refn'd	June 1	June, 1895	June, 1915	4 00	100000 00	4 %	2004 00	4008 00
Second	Dec. 1			4 00			2004 00	
Ninth	July 1	July, 1903			80000 00	3½ %	1400 00	
	Jan. 1						1400 00	
Tenth	July 1	July, 1904	July, 1924		90000 00	4 %	1800 00	3600 00
	Jan. 1						1800 00	

CASHIER’S ANNUAL REPORT.

GRAND RAPIDS, MICH., May 1, 1905.

To the Honorable Board of Public Works :

GENTLEMEN—I herewith submit a report as cashier of said Board at the close of the year, April 15, 1905.

Balance on hand May 1, 1904		\$406 16	
Received from Water Rates	\$139535 28		
Received from water permits.....	2032 50		
Received from miscellaneous receipts.....	12213 46		
Total receipts.....		153781 24	
DEPOSITS			
To water works fund			\$153556 15
To general fund			30 00
To water works extention fund... ..			309 39
Balance on hand April 16, 1905.....			291 86
Total		\$154187 40	\$154187 40

Respectfully submitted,
CHARLES . D. STEBBINS,
Cashier.

ANNUAL REPORT OF INSPECTION
DEPARTMENT.

GRAND RAPIDS, MICH., April 15, 1905.

To the Honorable Board of Public Works :

GENTLEMEN—Herewith is respectfully submitted the annual report of the Inspection department for the year ending, April 15, 1905 :

WATER SERVICES.

Number of schedule services	9,212
Number of metered services.....	3,751
Number of services to curb or lot line only.....	647
Number of services for fire protection.....	112
Number of services for elevators.....	25
Number of services for water troughs.....	50
Total.....	13,797

Distributed as follows, in the three districts :

NORTH DISTRICT.

Schedule.....	3,444
Metered.	1,277
To curb or lot line.....	323
Total	5,044

SOUTH DISTRICT.

Schedule.....	3,348
Metered	1,321
To curb or lot line	287
Total.....	4,956

WEST DISTRICT.

Schedule.....	2,420
Metered	1,153
To curb or lot line.....	37
Total	3,610

Total number of private meters	453
Total number of services cut off at main and abandoned.....	230
Total number of services discontinued and using water from Hydraulic Co.....	163
Total number of water permits issued from May 1st, 1904 to April 15th, 1905.....	833

WATER FIXTURES.

Baths.....	2,780
Hopper closets	2,916
Tank closets.....	5,947
Basins	2,725
Kitchen sinks	4,312
Urinals ...	81
Yard hydrants.....	6,016
Sill cocks.....	6,298
Hydraulic pumps.....	835
Water troughs.....	50
Sprinkling oranes.....	27
Miscellaneous fixtures.....	930
Total.....	<u>32,416</u>

Distributed in the several districts as shown in the following table :

WARDS	Baths	Hopper Closets	Tank Closets	Basins	Sinks	Urinals	Hydrants	3/4 Cocks	Hydraulic Pumps	Water Troughs	Sprinkling Cranes	Miscellaneous	Total
First and Twelfth	154	117	326	141	276	.....	768	433	3	6	5	63	2291
Tenth and Eleventh	838	413	1438	732	960	5	969	1801	74	9	8	262	7509
Third	554	742	1319	668	867	5	645	1106	127	2	3	357	6305
Second, Fourth and Fifth	605	427	1365	640	1050	8	1393	1210	89	14	4	168	6973
Sixth and Seventh	472	1091	1140	411	970	53	1246	1355	29	14	4	41	7326
Eighth and Ninth	147	126	341	121	175	1	578	371	3	5	3	35	1906
Engine Houses	10	.....	14	10	13	9	4	23	.....	.....	.....	13	96
Parks .....	.....	.....	.....	.....	.....	.....	13	.....	.....	.....	.....	.....	13
Cemeteries .....	.....	.....	4	2	1	.....	1	.....	.....	.....	.....	.....	8
Grand Total	2780	2916	5947	2725	4312	81	6016	6396	325	50	27	939	32416

Included in this tabulation is a complete list of water fixtures in the West district, both metered and schedule. In the North and South districts, the fixtures given are for schedule services only. Until the house to house inspection, which is now in progress, is finished, a complete list of fixtures cannot be given.

Embodied in the following statement is a report of the work done by the Inspectors employed in this department during the past year :

Number of inspections and investigations made and notices served.....	11,788
Number of meter readings.....	28,421
Number of water services to curb inspected.....	385
Number of high reading meter notices.....	1,173
Number of water waste notices served.....	480
Number of notices to property owners to make water connection.....	610
Number of leaks found and owners notified.....	1,000
Number of services turned on.....	900
Number of services turned off.....	1,085
Number of fixtures capped and uncapped.....	25
Number of hopper closet permits granted.....	60
Number of hopper closet permits denied.....	5
Number of reports of Chief Inspector to Board.....	134

METERS.

	1/2	3/4	1	1 1/2	2	3	4	6	Total
Crown.....	1223	184	90	1	35	1	3	1	1488
Worthington.....	337	18	43		16		1		394
Nash.....	5	1453	93	40	2	7			1601
Thompson.....	2	1			1				4
Trident.....	302	5	3	3			1		313
Union Rotary.....	1	2		4		1			8
Duplex.....	11								11
Gen.....					3	6	16	1	26
Hersey.....	12	6	19		5				41
Union Columbia.....	5								5
Lambert.....	11	5							16
Westinghouse.....	1								1
Pittsburgh.....	3								3
Empire.....	96	34	6		15				151
Standard.....	1								1
Total.....	5	3246	318	300	10	71	8	19	3900

Total number of Meters in service April 15, 1905.—3880.

During the past year nine hundred and eighty meters have been installed. Of this number, two hundred and fifty-three were purchased by water consumers and installed by the water department. At the expiration of four years from date of purchase, these meters become the property of the Department, the cost of the meter having been returned to the consumer in rebates on water bills. About seven hundred meters were placed, during the past year, on services having Hopper closets and where an inspection showed that water was being wasted. The weekly reports from the pumping station are showing a noticeable decrease in the amount of water pumped, and this would indicate that the liberal installation of meters on these last mentioned services has been a step in the right direction, and that a continuation of this policy is advisable in order to "stop the waste."

Respectfully submitted,

ADOLPH WURZBURG,

Chief Inspector.

SUPERINTENDENT'S REPORT.

Grand Rapids, Mich., April 15, 1905.

To the Honorable Board of Public Works :

GENTLEMEN :—Herewith are submitted the annual reports for the City Lighting Plant, City Pumping Station, and City Repair Shops, for the year ending April 15, 1905.

LIGHTING PLANT.

MACHINERY.

The engines, dynamos and auxilliary machinery are in good condition. During the year new high pressure cylinders have been placed on engines Nos. 1 and 2 to replace defective cylinders. The new cylinder for No. 3 engine is at the plant and is ready to be installed as soon as necessary.

PUMPING STATION.

PUMPS.

The pumping engines were overhauled during June and July of the past year, this became necessary on account of the sand and other matter that lodged over the intake after the high water in the spring and gradually found its way into the settling basin and pump well, causing the cutting of the plungers and valves. During the time that the pumps were in this condition, the pumping report shows a very high pumpage, as will be noticed in the water report for June and July of the at-

tached report. The cleaning of the pump well and basin was completed July 26, 1904, and the pumping was reduced to normal condition.

BOILERS.

The boilers at the station are in good condition. On the second day of December the boilers were equipped with Little Giant Stokers, and No. 3 boiler was put in operation with stoker, on December 4, 1904.

Respectfully submitted,

BARNEY MEYER,
General Superintendent.

CITY LIGHTING PLANT.

SUMMARY OF REPORT ENDING APRIL 15, 1905.

Average number of lamps operated per day, 687.

Average number of hours operated per day, 10:39.

	Total Cost	Average Cost per day	Average Cost per lamp per day	Average Cost per kilo- watt hour
Coal	\$ 8523 70	\$ 24 35	.035444	.0082907
Wages.....	10589 08	30 26	.0440465	.0103031
Carbons.....	767 90	2 19	.0031873	.0007457
Globes.....	395 56	1 13	.0016448	.0003847
Repairs.....	3054 61	8 73	.0127074	.0029724
Supplies.....	2933 48	8 38	.012198	.0028533
Cylinder Oil.....	195 98	56	.0008152	.0001906
Engine Oil.....	125 47	36	.000524	.0001226
Totals.....	\$26585 78	\$ 75 96	.1105677	.0258631

Average cost per lamp per year (operation only) on above basis, \$40 36.

COAL RECORD.

	Total pounds consumed per month	Total cost per month	Av. pounds consumed per day	Average Cost per day
May	404465	\$ 575 80	13047	\$ 18 57
June.....	353592	512 64	11787	17 09
July.....	383895	556 59	12384	17 95
August.....	408869	592 80	13189	19 12
September.....	474949	683 10	15832	22 77
October... ..	576692	821 63	18603	26 50
November	588178	838 08	19606	27 93
December	632995	901 84	20417	29 09
January... ..	668418	980 95	22307	31 64
February.....	655404	888 22	23408	31 72
March.....	691975	840 59	22323	27 11
April (15 days)	280153	331 46	18677	22 10
Totals	6139515	\$ 8523 70	.....	.....
Average.....	583871	\$ 741 19	17541	\$ 24 35

COAL RECORD—CONTINUED.

	Av. pounds per lamp per day	Average Cost per lamp per day	Av. pounds per K. W. hour per day	Average Cost per K. W. hour per day
May	20.4	.0290157	6.	.0085419
June	18.8	.0265786	6.	.0087017
July	19.	.0275307	6.	.008701
August	19.5	.028326	6.01	.0087107
September	22.7	.0328098	6.	.008695
October	26.6	.0379656	5.99	.0085428
November	28.1	.0400717	6.	.0085465
December	29.	.0418798	6.	.0085484
January	31.3	.0446262	6.	.0085491
February	32.9	.044613	6.	.0081313
March	31.3	.0380224	6.	.0072876
April (15 days)	26.2	.0309958	6.	.0070992
Totals .....	.....	.....	.....	.....
Averages	25.5	.035444	6.	.0082907

LAMP RECORD.

	Lamps in circuit per day	Reported out per day	Operated per day	Av. hours operated per day	Av. kilowatt hours per day
May	643	3	640	7:42	2174
June	645	2	643	7:36	1964
July	653	1	652	7:43	2063
August	677	2	675	8:39	2195
September	697	3	694	10:14	2540
October	701	3	698	11:49	3102
November	700	3	697	13:03	3268
December	706	3	703	13:51	3403
January	713	4	709	13:31	3701
February	714	3	711	12:27	3901
March	717	4	713	11:20	3720
April (15 days) ..	717	4	713	9:47	3113
Averages	696	3	687	10:39	2957

REPORT OF BOARD OF PUBLIC WORKS

WAGE RECORD.

	Total monthly pay roll	Average daily pay roll	Average wages per lamp per day	Average cost per kilowatt hour
May.....	\$ 1102 90	\$ 35 58	.0555988	.0163661
June.....	876 74	29 23	.0454588	.0148829
July.....	784 18	26 30	.0388086	.0128637
August.....	1050 99	33 91	.0502370	.0154487
September.....	891 63	29 72	.0498244	.0112576
October.....	1079 85	34 84	.0499141	.0112315
November.....	876 92	29 23	.0419268	.0089443
December.....	1022 59	32 99	.0469275	.0096944
January.....	820 08	26 46	.0373202	.0071494
February.....	889 53	29 98	.042166	.0076852
March.....	839 53	27 08	.0379804	.0072796
April (15 days).....	404 14	26 94	.037784	.0086541
Total.....	\$10589 08	.....	.....	.....
Averages.....	920 79	\$ 30 26	.0440465	.0103081

CARBON RECORD.

	Total carbons used per month	Total cost of carbons per month	Aver. carbon used per day	Aver. cost per day	Aver. us'd p'r lamp per day	Average cost per lamp per day	Average cost per kilowatt hour
May.....	2049	\$ 54 28	66	\$ 1 75	.10	.0027343	.000805
June.....	1935	51 25	64	1 70	.10	.0026433	.0008656
July.....	1754	46 46	57	1 50	.09	.0023007	.0007272
August.....	1919	50 83	63	1 64	.09	.0024297	.0007472
September.....	2288	60 61	76	2 02	.11	.0029106	.0007652
October.....	2499	66 20	81	2 13	.12	.0030616	.0006966
November.....	2620	69 40	87	2 31	.13	.0033144	.0007069
December.....	3338	88 42	108	2 85	.15	.0040541	.0008375
January.....	3299	87 39	106	2 82	.15	.0039775	.0007619
February.....	2853	75 58	102	2 70	.14	.0037975	.0006922
March.....	3099	82 09	100	2 65	.14	.0037167	.0007194
April (15 days).....	1336	35 39	89	2 36	.12	.003311	.0007581
Totals.....	28989	\$ 767 90	.....	.....	.....	.....	.....
Averages....	2521	66 77	83	\$ 2 19	.12	.0031878	.0007457

GLOBE RECORD.

	Inner globe used per month	Outer globe per month	Cost of inner and outer globes used per month	Aver. inner globes used per day	Ave. outer globes used per day	Aver. cost of inner and outer globes used per day	Aver. cost of inner and outer globes used per lamp per day	Aver. cost of globes per K. W. hour
May.....	266	20	\$26 33	9	.7	\$1 17	.0016221	.0006322
June.....	300	16	26 55	9	.5	1 22	.0018975	.0006311
July.	315	9	26 37	10	.3	1 14	.0017485	.0006596
August	335	18	42 79	11	.6	1 35	.0020445	.0008237
September	353	12	41 18	12	.4	1 37	.0019111	.0006128
October.	352	6	37 32	8	.2	88	.0012606	.0002337
November	296	12	37 32	8	.4	99	.0014202	.0003089
December.....	295	6	37 32	9	.3	1 14	.0013216	.0003326
January.....	261	7	33 49	10	.2	1 08	.0015234	.0003919
February.....	263	6	33 35	11	.2	96	.0013324	.0002564
March	263	5	29 33	9	.2	1 19	.0016737	.0003051
April (15 days).	101	6	15 20	7	.4	1 01	.0014166	.0002245
Totals.....	3330	125	\$306 56	.....	.....	.....	.....	.....
Averages ...	997	11	\$4 40	9	.4	1 13	.0016448	.0003247

REPORT OF BOARD OF PUBLIC WORKS

SUPPLY RECORD.

	Total cost of supplies per month	Average cost per day	Average cost per lamp per day	Average cost per kilo-watt hour
May.....	\$ 142 48	\$ 4 60	.0071875	.0021159
June.....	197 63	6 59	.0102484	.0033554
July.....	213 23	6 88	.0105521	.003335
August.....	318 72	10 27	.0152148	.0046788
September.....	240 91	8 03	.0115705	.0030417
October.....	214 45	6 92	.0099141	.0022307
November.....	263 53	8 79	.0126112	.0026897
December.....	233 36	7 53	.0107112	.0022128
January.....	236 47	7 63	.0107618	.0020617
February.....	311 27	11 12	.01564	.0033504
March.....	378 65	12 31	.0171248	.0032823
April (15 days).....	182 78	12 18	.0170327	.0039126
Totals.....	\$ 2933 48	.....	.....	.....
Averages.....	255 08	\$ 8 38	.012198	.0028533

REPAIR RECORD.

	Total cost per month	Average cost per day	Average cost per lamp per day	Average cost per kilo-watt hour
May.....	\$ 223 62	\$ 7 21	.0112656	.0033164
June.....	215 94	7 19	.0111821	.0033609
July.....	174 24	5 62	.0086196	.0027243
August.....	221 27	7 14	.0105777	.0033429
September.....	237 84	7 60	.010951	.0028788
October.....	261 16	8 43	.0120774	.0027175
November.....	268 57	8 96	.0123406	.0027387
December.....	350 76	11 31	.0160882	.0033235
January.....	314 32	10 14	.0143018	.0027398
February.....	333 85	11 89	.016723	.003043
March.....	300 17	9 69	.0135905	.0026048
April (15 days).....	163 87	10 93	.0153296	.0035111
Totals.....	\$ 3054 61	.....	.....	.....
Averages.....	265 62	\$ 8 73	.0127074	.0039724

CITY OF GRAND RAPIDS, MICH.

29

CYLINDER OIL RECORD.

	Total cost per month	Average cost per day	Average cost per lamp per day	Average cost per kilo-watt hour
May	\$ 13 30	\$.43	.0008718	.0001978
June	11 70	.39	.0008086	.0001966
July	13 00	.42	.0008442	.0002098
August	12 99	.42	.0008222	.0001914
September	13 25	.44	.000834	.0001987
October	13 24	.43	.0008161	.0001887
November	13 38	.45	.0008547	.0001877
December	13 37	.43	.0008117	.0001963
January	12 88	.41	.0008783	.0001107
February	29 37	1.41	.0019831	.0008614
March	26 50	.86	.0011922	.0008786
April (15 days)	13 40	.86	.0012022	.0008768
Total	\$ 126 06			
Averages	17 04	\$.56	.0008152	.0001906

ENGINE OIL RECORD.

	Total cost per month	Average cost per day	Average cost per lamp per day	Average cost per kilo-watt hour
May	\$ 10 40	\$.35	.0005469	.000161
June	12 00	.40	.0006221	.0002090
July	10 40	.33	.0005032	.00016
August	10 40	.34	.0005037	.0001540
September	10 50	.35	.0005048	.0001340
October	10 60	.34	.0004871	.0001090
November	10 00	.33	.0004735	.0001111
December	10 11	.33	.0004894	.0000990
January	10 40	.33	.0004655	.0000891
February	10 40	.37	.0005204	.0000948
March	10 00	.33	.0004623	.0000867
April (15 days)	9 97	.67	.0009897	.0000152
Total	\$ 126 47			
Averages	10 91	\$.36	.000521	.0001226

CONSTRUCTION REPORT

Lamps	\$ 1105 00
Wire	609 26
Cable.....	355 00
Supplies	291 86
Labor	350 52
Ornamental Poles.....	252 56
Freight.....	30 30
Livery.....	5 50
Total.....	\$ 3000 00

REPAIRING ELECTRIC LIGHT
TOWERS.

Wire	\$ 361 69
Supplies	10 85
Wages	127 46
Total.....	\$ 500 00

SUMMARY.

ANNUAL REPORT CITY PUMPING STATION FOR THE YEAR
ENDING APRIL 15, 1905.

	Total cost of	Average cost per day of	Average cost per 1,000,000 gals of
Coal	\$ 18823 24	\$ 53 73	\$ 3 84
Wages.....	9555 93	27 30	1 95
Repairs ..	2894 71	8 27	59
Supplies.....	2569 03	7 34	53
Oils.....	449 68	1 29	09
Totals.....	\$ 34992 59	\$ 97 98	\$ 7 00

COAL RECORD.

	Total lbs. consumed per month	Total cost of coal consumed per month	Avg'e lbs. consumed per day	Avg'e cost of coal consumed per day	Av. lbs. per 1,000,000 gallons	Av. cost per 1,000,000 gallons
May	1,089,910	\$1,918 09	35,158	\$ 61 87	2,525	\$ 4 44
June	1,522,500	2,510 18	50,750	83 67	2,637	4 35
July	1,508,450	2,191 93	48,660	70 71	2,387	3 46
August	1,151,050	1,647 47	37,131	53 14	2,417	3 46
September	1,067,450	1,483 00	35,589	49 43	2,439	3 38
October	1,021,350	1,409 69	32,943	45 47	2,723	3 75
November	883,700	1,278 75	29,456	42 62	2,752	3 96
December	1,102,350	1,421 99	35,560	45 87	3,108	4 01
January	1,134,210	1,463 11	36,587	47 20	3,075	3 96
February	1,179,000	1,520 91	42,107	54 32	3,021	3 90
March	1,065,200	1,399 98	35,006	45 16	2,961	3 82
April (15 days)	460,900	578 14	30,727	38 54	2,873	3 60
Totals	13,205,970	\$18,823 24	.....	.....	.....	.....
Averages	1,148,845	1,636 80	37,731	\$ 53 78	2,697	\$ 3 84

WAGE RECORD.

	Average cost per month	Average cost per day	Average cost per 1,000,000 gallons
May	\$ 948 06	\$ 30 58	\$ 2 20
June	768 33	25 61	1 35
July	765 75	24 88	1 19
August	958 02	30 91	2 01
September	760 07	25 34	1 73
October	955 92	30 84	2 54
November	760 29	25 34	2 37
December	950 02	30 65	2 67
January	768 97	24 48	2 06
February	775 76	27 71	1 98
March	776 03	25 03	2 12
April (15 days)	388 71	25 92	2 42
Totals	\$ 9,555 93	.....	.....
Averages	830 95	\$ 27 30	\$ 1 95

REPAIR RECORD.

	Total repairs for month	Av'ge repairs per day	Av'ge cost of repairs per 1,000,000 gals.
May.....	\$ 225 48	\$ 7 97	\$.52
June.....	452 00	15 09	.79
July	408 93	13 13	.64
August	472 42	15 24	.93
September... ..	287 34	9 58	.65
October	292 46	9 43	.75
November	151 87	5 06	.47
December.....	140 01	4 51	.39
January.	153 27	4 94	.42
February	101 15	3 61	.26
March	119 81	3 87	.33
April (15 days).....	91 27	6 09	.57
Totals	\$ 2,894 71	.....	.....
Averages	251 71	\$ 8 27	\$.59

SUPPLY RECORD.

	Total cost for month	Average cost per day	Average cost per 1,000,000 gallons
May	\$ 160 23	\$ 5 17	\$.36
June.....	194 73	6 49	.35
July.....	247 83	7 99	.39
August.....	419 83	13 54	.88
September	180 17	6 01	.41
October	215 00	6 94	.57
November	230 73	7 36	.69
December.....	270 81	8 74	.77
January	198 19	6 40	.53
February.....	170 03	6 07	.43
March.....	186 16	6 01	.50
April (15 days)	105 32	7 01	.65
Totals.....	\$ 2,569 03	.....	.....
Averages.....	223 39	\$ 7 34	\$.53

OIL RECORD.

	Cost per month	Average cost per day	Average cost per 1,000,000 gallons
May.....	\$ 50 70	\$ 1 64	\$.13
June.....	40 09	1 34	.08
July.....	49 40	1 59	.07
August.....	49 34	1 59	.09
September.....	50 13	1 67	.12
October.....	37 99	1 23	.10
November.....	36 20	1 21	.11
December.....	30 28	98	.09
January.....	23 50	76	.07
February.....	27 00	96	.07
March.....	30 85	99	.09
April (15 days).....	24 20	1 62	.15
Totals.....	\$ 449 68	.....	.....
Averages.....	39 10	\$ 1 29	\$.09

WATER REPORT.

Table showing the amount of water pumped into the High and Low Services for the year ending April 15, 1905, and the total pumping record :

	LOW SERVICE		HIGH SERVICE	
	Total gallons pumped per month	Av'ge gallons pumped per day	Av'ge gallons pumped per day	Total gallons pumped per month
May.....	236,454,402	7,627,561	195,099,420	6,993,530
June.....	307,982,300	10,264,410	265,078,554	8,835,952
July.....	337,161,320	10,876,172	297,891,592	9,609,406
August.....	250,601,719	8,083,927	227,283,894	7,331,738
September.....	234,312,469	7,810,449	204,814,144	6,827,128
October.....	227,798,706	7,348,345	148,134,352	4,778,528
November.....	190,841,643	6,361,388	130,236,286	4,341,310
December.....	211,800,017	6,832,259	143,047,858	4,614,447
January.....	213,139,035	6,875,453	155,704,120	5,022,712
February.....	219,910,023	7,853,929	171,006,664	6,107,381
March.....	201,099,507	6,487,081	165,132,272	5,326,547
April (15 days).....	86,779,391	5,785,293	74,067,172	4,937,811
Totals.....	2,717,831,532	.....	2,177,496,328	.....
Averages.....	236,333,176	7,765,233	189,347,597	6,221,418

	Total gallons pumped per month	Av'ge gallons pumped per day
May.....	431,553,822	13,921,091
June.....	573,010,854	19,100,368
July.....	635,052,912	20,485,578
August.....	477,885,613	15,415,665
September.....	439,127,613	14,637,587
October.....	375,983,058	12,196,873
November.....	321,077,929	10,702,598
December.....	354,847,875	11,446,706
January.....	368,843,155	11,898,166
February.....	390,916,687	13,961,310
March.....	366,231,779	11,813,928
April (15 days).....	160,846,563	10,723,104
Totals.....	4,895,327,860	.....
Averages.....	425,680,683	13,986,651

CITY REPAIR SHOPS.

REPORT FOR THE YEAR ENDING APRIL 15, 1906.

Total pay roll for the year.....	\$ 25188 19
Average pay roll for the month.....	2185 93
Average pay roll per day.....	71 82
The wages were distributed as follows :	
Meters set.....	907
Meters set (private).....	172
Patent meter boxes set.....	179
Concrete meter boxes set.....	452
Wooden meter boxes set.....	19
Total cost.....	8944 87
Meters taken out.....	1160
Meters reset.....	1312
Meters repaired.....	1153
Meters packed to prevent freezing.....	338
Meters put in scrap.....	15
Meters moved.....	3
Patent meter boxes repaired.....	43
Concrete Meter boxes repaired.....	4
Wooden meter boxes repaired.....	2
Patent meter boxes taken out.....	1
Wooden meter boxes taken out.....	2
Total cost.....	2785 40
Services forced out.....	205
Services inspected.....	236
Services repaired.....	14
Services turned on.....	121
Services turned off.....	222
Services turned off at main.....	30
Services lowered.....	5
Services connected.....	1
Services made (Street opening fund).....	695
Special connections made (fire protection).....	2
2 inch taps made.....	1
1 inch taps made.....	29
¾ inch taps made.....	25
½ inch taps made.....	502
¼ inch taps made.....	251
1 inch retaps made.....	7
¾ inch retaps made.....	28
½ inch retaps made.....	103
¼ inch retaps made.....	341
Total cost.....	2436 68
Fire hydrants thawed out.....	2429

Fire hydrants pumped out.....	2803	
Fire hydrants repaired.....	207	
Fire hydrants moved.....	4	
Fire hydrants set.....	1	
Fire hydrants taken out.....	1	
Total cost.....		1400 28
Sprinkling cranes erected.....	25	
Sprinkling cranes taken down.....	23	
Sprinkling cranes repaired.....	4	
Sprinkling cranes moved.....	3	
Total cost.....		73 88
Street valves placed.....	1	
Street valves repaired.....	29	
Street valve boxes repaired.....	8	
Total cost.....		298 48
Leaks in mains repaired.....	273	
Mains thawed	6	
Total cost		3773 41
Superintendent's salary.....		1154 00
Clerk's salary		607 00
Labor on new water mains.....		936 80
Labor at reservoir.....		21 45
Labor at intake.....		2693 58
Labor at stables.....		396 09
Labor at shops and storeroom		1497 67
Labor furnished at lighting plant (repairs).....		1440 13
Labor furnished lighting plant (repairing towers) ..		46 10
Labor furnished electric light extension fund.....		99
Labor furnished at pumping station (repairs).....		1885 05
Labor furnished water works ext. fund (testing and repairing mains)		98 23
Labor furnished inspection dept.....		57 75
Labor furnished road roller fund (repairs).....		277 35
Total pay roll for the year.....		\$ 25138 19

REPORT OF CITY ENGINEER.

GRAND RAPIDS, MICH., April 15, 1905.

To the Honorable Board of Public Works:

GENTLEMEN—Herewith is presented the annual report of the work done by the Engineering Department during the fiscal year ending April 14th, 1905:

STREETS.

Profiles have been prepared and grade lines established upon streets and alleys to a total length of 0.37 of a mile during the year. .934 miles of streets have been added to the total mileage of 286.263 reported a year ago. 174.110 miles have been improved, leaving 113,087 miles, or about 39 per cent. of the total mileage still unimproved.

Grades have been re-established during the year on 1.48 miles of streets. The streets or alleys, extent and length of each, upon which grades have been established or re-established, are given in the tables below:

GRADE LINES ESTABLISHED.

STREET	EXTENT	Length in feet
Church.....	.....	375
Hodgson.....	S. Lafayette, west.....	280
West.....	Fourth to Seventh.....	1025
Pike.....	Campau to Grand River.....	275

1955 feet or 0.37 mile.

RE-ESTABLISHED.

STREET	EXTENT.	Length in feet
S. Fuller	Fifth Ave. to Prince	594
S. Fuller.....	Lake Ave. to E. Fulton.. ..	1482
W. Bridge,.....	Lincoln to west city limits.....	3080
Frances Ave.....	Burton Ave. north.....	537
Worden.....	Carlton to S. Fuller.. ...	650
West.....	W. Bridge to Fourth.....	1550

7982 feet or 1.49 miles.

STREET IMPROVEMENTS.

Street improvement bonds to the amount of \$200,-000.00 were issued during the year. A large percentage of the work was ordered previous to the close of last municipal year, and with the exception of a few gravel improvements, all were practically completed. The foundation course, and in more cases the curb and gutters on gravel improvements were completed and the streets left in good condition for travel during the winter. Work would have been farther advanced if sufficient rollers had been available. Work has started early this spring and unless an unusual large amount of work is ordered, it can be readily handled with the present number of rollers.

Screened gravel improvements with combination curb and gutter brick bordered were made in about the usual amount. Complaint has come from some quarters that this quality of improvement is too expensive for the suburban districts. Where the grade is not so heavy as to cause the gutters washing out by heavy rains when not protected, the omission of the curb and gutters has often been recommended, Many consider

the parking effect secured by bringing the sod to the gravel as giving a more pleasing effect than can be secured with the curb. If the gutters were always free from grass or weeds, and sod kept well cut and the gutter line clearly defined, such construction would be more popular. There are generally several on a street who do not take sufficient pride in the appearance of the street to give it the necessary attention. Generally the property owners prefer to pay the additional price and secure the curb and gutters.

Except in sections where the future developement is problematic or sewer and water can not be laid previous to the improvement, economy in constructing should be secured by omitting the curb and gutters rather than by cheapening the character of the roadbed. On the ordinary residence street the standard screen gravel construction, with a small amount of timely and intelligent repairs, should have a life of from twenty to thirty years. The curb and gutters may be added at any time and with but little expense in addition to the curb and gutters.

Your action in adopting a narrower roadway, the standard width of 26 feet on a 66 foot street without car tracks, will materially reduce the cost of improvements and repairs as well as improve the appearance of the streets.

Where the sewer and water cannot be laid and the property is but sparsely built up, the grading of the street alone will often meet all present needs. This character of improvement was adopted on Fuller street from Sherman street to Fifth Avenue. The fine drift

ing sand was transformed into a comparatively hard roadway by the addition of two inches of clay, from a neighboring street, the clay being thoroughly harrowed into the sand.

A pleasing departure from standard construction was made in the improvement of Quigley Auenue. The use of concrete for the two fifteen foot driveways with the parkway between, has met the entire approval of the adjacent property owners. The cost was about 50 per cent. in excess of the gravel improvements on the adjacent streets.

The bituminous Macadam improvement on North Lafayette Sreet was completed after tedious delays. The street presents a pleasing appearance and is entirely satisfactory, except for the hardness of the bitumen used on the surface. If this had been softer it would have given a better foothold for horses and had greater life. This defect can be remedied when the street has had more wear, by the application of a flush coat of bitumen and stone chips or coarse sand rolled in.

North Union Street was improved with asphalt blocks on a gravel and cobble stone foundation. Under protest from this department the above foundation was used. All possible precautions were used to secure a good foundation but the vibration of the rails makes it difficult to hclld the blocks in position. The contractor has relaid some portions several times and will be to considerable trouble and expense during the life of the guarantee. The old cobble stone combined with gravel and properly rolled makes an excellent foundation on residence streets. Only a concrete foundation should be used in streets having street car tracks.

The completion of the improvement of Turner Street where separation of grades with the D., G. H. & M. Ry., was secured, was delayed in repairing damages caused by the flood and in making the changes recommended by Mr. L. E. Cooley. The curb wall and roadway to the south have been raised about one and one-half feet above the high water of 1904 and prevents the possibility of the water passing through the subway unless the water shall far exceed that of 1904. The total amount of the roll, including one-half of the cost of the bridge work over the subway is \$10,646.85.

Hocking Valley and Wooster blocks were chiefly used in paving during the past year. The Hocking Valley gave very good satisfaction, but so much trouble was experienced with the Wooster, that they were finally barred from the street and the work completed with Metropolitan Block. The change in our specifications requiring each car load to be tested before loading will prevent a repetition of the experience with the Wooster paver on Ellsworth Ave.

The work completed and the new work contracted for during the past year is shown in the following tables :

REPORT OF BOARD OF PUBLIC WORKS

WORK LEFT OVER FROM 1903. COMPLETED IN 1904.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREET	EXTENT	DIMENSIONS				COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll		
†City Hall Alley.	Ottawa to Ionia.....	29	224	340	722	\$ 1514 44	\$ 1634 00	.....	J. H. Sullivan
Turner.....	700 to 900 feet north of North....	36	200	400	800	.....	10647 00	.....	City
†Grandville Ave...	Bartlett to Hall.	42	5080	old	31550	62500 00	63700 00	.....	J. McDermott & Son
Ellsworth Avenue	Wealthy Av. to 200 ft. s of Fulton	60	2363	4460	16900	35287 00	35287 00	.....	A. Prange
GRADED, GRAVELED AND GUTTERS PAVED.									
Twelfth.	McReynolds to Tamarac.....	30	1579	3238	.....	7670 00	7920 00	.....	D. W. Boyes
Widdcomb.....	Twelfth to W. Leonard	30	616	1306	.....	2751 00	2970 00	.....	D. W. Boyes
Fremont.....	Twelfth to W. Leonard.....	30	617	1306	.....	2500 00	2720 00	.....	Richard Pickett
Madison Avenue..	Umatilla to Fifth Avenue.....	30	2444	4903	.....	8440 00	8890 00	.....	Kloote & Vander Veen
Lake Avenue	Wealthy Avenue to City Limits.	30	614	1072	.....	2468 00	2600 00	.....	Gilner & Schneider
Rural.....	Lake Avenue to Sherman.....	28	980	1926	.....	4255 00	4555 00	.....	Gilner & Schneleer
Fifth Avenue.....	Kalamazoo to Neland Avenue...	42	816	1608	.....	3300 00	3500 00	.....	Kloote & Vander Veen
Fifth Avenue.....	Neland to Giddings Avenue.....	42	3340	4514	.....	15094 00	15544 00	.....	Kloote & Vander Veen
West Division....	W. Bridge to Shawmut Avenue.	16	1579	2363	.....	4730 00	5030 00	.....	Andrew Doyle
South Fuller.....	Wealthy Avenue to Sherman..	30	1320	2348	.....	5976 00	6356 00	.....	Andrew Doyle
Turner.....	North to 700 feet north	36	700	1452	.....	7200 00	7445 00	.....	Richard Pickett
Carleton Avenue..	Lake Avenue to East Fulton....	30	1755	3356	.....	11450 00	11800 00	.....	Kloote & Vander Veen
Seward.....	West Bridge to First.....	16	377	786	.....	1373 00	1590 00	.....	Andrew Doyle

GRADED, GRAVELED AND GUTTERS PAVED—CONTINUED.

STREET	EXTENT	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll	
Fairbanks.....	N. Lafayette to N. Prospect....	30	203	500	.....	\$1500 00	\$1740 00	J. B. Hooy
Buckeye.....	S. Diamond to Calkins Avenue..	30	656	2300	.....	5975 00	6200 00	Kloote & Vander Veen
Carroll Avenue...	Lake Avenue to Buckeye	30	503					
Baldwin.....	Packard to Dwight Avenue. ...	24	984	1861	.....	3745 00	3900 00	Kloate & Vander Veen
Morris Avenue....	Logan to Pleasant.....	30	804	1644	.....	.....	4475 00	City
Madison Avenue..	Umatilla to Hall.	36	140	146	.....	680 00	810 00	Kloote & Vander Veen
Sheridan Avenue.	Hall Street north.....	30	1853	3701	.....	7945 00	8235 00	Gilner & Schneider
Packard.....	E. Fulton to Lake Avenue.....	30	352	829	.....	1555 00	2025 00	James Sherlock
*Turner.....	900 ft. n. of North to City Limits	30	1734	None	.....	5229 00	5539 00	Richard Pickett
*Dayton.....	South Lane to Marlon.....	30	667	None	.....	1940 00	2110 00	W. D. Hembling
*White.....	Leonard to Walker.....	30	1192	None	.....	3100 00	3325 00	W. D. Hembling

BITUMINOUS MACADAM.

North Lafayette..	East Fulton to Fountain.....	29	756	1477	2180	6249 00	6490 00	A. C. Sekell
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* Graded and graveled. ‡ To replace cedar blocks.

WORK LET FROM MAY 1, 1904 TO MAY 1, 1905.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

Pearl Alley.....	Campau to Grand River.....	16	236	.....	502	1258 00	1403 00	J. H. Sullivan
Crescent Avenue..	Canal to North Division.....	38	1033	Old	4950	9650 00	9985 00	J. McDermott & Son

REPORT OF BOARD OF PUBLIC WORKS

WORK LEFT OVER FROM 1903. COMPLETED IN 1904.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREET	EXTENT	DIMENSIONS				COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll		
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†Grandville Ave...	Bartlett to Hall.	42	5030	old	31550	62500 00	63700 00	J. McDermott & Son
Ellsworth Avenue	Wealthy Av. to 200 ft. s of Fulton	60	2363	4460	16900	35387 00	35387 00	.....	A. Prange
GRADED, GRAVELED AND GUTTERS PAVED.									
Twelfth.	McReynolds to Tamarac.....	30	1579	3238	.....	7570 00	7920 00	.....	D. W. Boyes
Widdcomb	Twelfth to W. Leonard	30	616	1306	.....	2751 00	2970 00	.....	D. W. Boyes
Fremont	Twelfth to W. Leonard.....	30	617	1306	.....	2500 00	2720 00	.....	Richard Pickett
Madison Avenue..	Umatilla to Fifth Avenue.....	30	2444	4803	.....	8440 00	8890 00	.....	Kloote & Vander Veen
Lake Avenue	Wealthy Avenue to City Limits.	30	614	1072	.....	2468 00	2600 00	.....	Gilner & Schnelder
Rural.....	Lake Avenue to Sherman.....	28	980	1926	.....	4255 00	4555 00	.....	Gilner & Schneleer
Fifth Avenue.....	Kalamazoo to Neland Avenue...	42	816	1608	.....	3300 00	3500 00	.....	Kloote & Vander Veen
Fifth Avenue.....	Neland to Giddings Avenue.....	42	3340	4514	.....	15094 00	16544 00	.....	Kloote & Vander Veen
West Division....	W. Bridge to Shawmut Avenue.	16	1579	2363	.....	4730 00	5030 00	.....	Andrew Doyle
South Fuller.....	Wealthy Avenue to Sherman..	30	1330	2343	.....	5976 00	6256 00	.....	Andrew Doyle
Turner.....	North to 700 feet north	36	700	1452	.....	7200 00	7445 00	.....	Richard Pickett
Carleton Avenue..	Lake Avenue to East Fulton....	30	1755	3356	.....	11450 00	11900 00	.....	Kloote & Vander Veen
Seward.....	West Bridge to First.....	16	377	736	.....	1373 00	1530 00	.....	Andrew Doyle

GRADED, GRAVELED AND GUTTERS PAVED—CONTINUED.

STREET	EXTENT	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll	
Fairbanks.....	N. Lafayette to N. Prospect....	30	203	500	.....	\$1500 00	\$1740 00	J. B. Hoey
Buckeye.....	S. Diamond to Calkins Avenue..	30	656	2300	.....	5075 00	6200 00	Kloote & Vander Veen
Carroll Avenue...	Lake Avenue to Buckeye ..	30	503		.....			Kloote & Vander Veen
Baldwin.....	Packard to Dwight Avenue. ...	24	984	1861	.....	3745 00	3980 00	City
Morris Avenue....	Logan to Pleasant.....	30	804	1644	.....	.....	4475 00	Kloote & Vander Veen
Madison Avenue..	Umatilla to Hall.	36	140	146	.....	680 00	810 00	Gilner & Schneider
Sheridan Avenue.	Hall Street north.....	30	1853	3701	.....	7945 00	8235 00	James Sherlock
Packard.....	E. Fulton to Lake Avenue.....	30	352	829	.....	1855 00	2025 00	Richard Pickett
*Turner.....	900 ft. n. of North to City Limits	30	1734	None	.....	5229 00	5539 00	W. D. Hembling
*Dayton.....	South Lane to Marion.....	30	667	None	.....	1940 00	2110 00	W. D. Hembling
*White.....	Leonard to Walker.....	30	1192	None	.....	3100 00	3325 00	

BITUMINOUS MACADAM.

North Lafayette..	East Fulton to Fountain.....	29	756	1477	2180	6249 00	6490 00	A. C. Sekell
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* Graded and graveled. † To replace cedar blocks.

WORK LET FROM MAY 1, 1904 TO MAY 1, 1905.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

Pearl Alley.....	Campau to Grand River.....	16	236	.....	502	1268 00	1403 00	J. H. Sullivan
Crescent Avenue..	Canal to North Division.....	38	1033	Old	4950	9650 00	9985 00	J. McDermott & Son

WORK LEFT OVER FROM 1903. COMPLETED IN 1904.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREET	EXTENT	DIMENSIONS				COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll		
†City Hall Alley .	Ottawa to Ionia.....	29	224	340	722	\$ 1514 44	\$ 1634 00	.....	J. H. Sullivan
Turner	700 to 900 feet north of North....	36	200	400	800	.... .	10647 00	.....	City
†Grandville Ave...	Bartlett to Hall.	42	5030	old	31550	62500 00	63700 00	.....	J. McDermott & Son
Ellsworth Avenue	Wealthy Av. to 200 ft. s of Fulton	60	2363	4460	16900	35387 00	35387 00	.....	A. Prange
GRADED, GRAVELED AND GUTTERS PAVED.									
Twelfth.	McReynolds to Tamarac.....	30	1579	3238	.....	7570 00	7920 00	.....	D. W. Boyes
Widdcomb	Twelfth to W. Leonard	30	616	1306	.....	2751 00	2970 00	.....	D. W. Boyes
Fremont	Twelfth to W. Leonard.....	30	617	1306	.....	2300 00	2720 00	.....	Richard Pickett
Madison Avenue..	Umatilla to Fifth Avenue.....	30	2444	4903	.....	8440 00	8890 00	.....	Kloote & Vander Veen
Lake Avenue	Wealthy Avenue to City Limits.	30	614	1072	.....	2468 00	2690 00	.....	Gilner & Schneider
Rural.....	Lake Avenue to Sherman.....	28	980	1926	.....	4255 00	4555 00	.....	Gilner & Schneier
Fifth Avenue.....	Kalamazoo to Neland Avenue...	42	816	1608	.....	3300 00	3500 00	.....	Kloote & Vander Veen
Fifth Avenue.....	Neland to Giddings Avenue.....	42	3340	4514	.....	15094 00	15544 00	.....	Kloote & Vander Veen
West Division....	W. Bridge to Shawmut Avenue.	16	1579	2333	.....	4730 00	5030 00	.....	Andrew Doyle
South Fuller.....	Wealthy Avenue to Sherman..	30	1320	2343	.....	5976 00	6256 00	.....	Andrew Doyle
Turner.....	North to 700 feet north	36	700	1452	.....	7200 00	7445 00	.....	Richard Pickett
Carleton Avenue..	Lake Avenue to East Fulton....	30	1755	3356	.....	11450 00	11800 00	.....	Kloote & Vander Veen
Seward.....	West Bridge to First.....	16	377	736	.....	1373 00	1530 00	.....	Andrew Doyle

GRADED, GRAVELED AND GUTTERS PAVED—CONTINUED.

STREET	EXTENT	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll	
Fairbanks.....	N. Lafayette to N. Prospect....	30	203	500	.....	\$1590 00	\$1740 00	J. B. Hoey
Buckeye.....	S. Diamond to Calkins Avenue..	30	656	2300	.....	5975 00	6200 00	Kloote & Vander Veen
Carroll Avenue...	Lake Avenue to Buckeye ..	30	503		.....			Kloote & Vander Veen
Baldwin.....	Packard to Dwight Avenue. ...	24	984	1861	.....	3745 00	3980 00	City
Morris Avenue....	Logan to Pleasant.....	30	804	1644	.....	.....	4475 00	Kloote & Vander Veen
Madison Avenue..	Umatilla to Hall.	36	140	146	.....	680 00	810 00	Gilner & Schneider
Sheridan Avenue.	Hall Street north.....	30	1853	3701	.....	7945 00	8235 00	James Sherlock
Packard.....	E. Fulton to Lake Avenue.....	30	352	829	.....	1555 00	2025 00	Richard Pickett
*Turner.....	900 ft. n. of North to City Limits	30	1734	None	.....	5229 00	5539 00	W. D. Hembling
*Dayton.....	South Lane to Marlon.....	30	667	None	.....	1940 00	2110 00	W. D. Hembling
*White.....	Leonard to Walker.....	30	1192	None	.....	3100 00	3325 00	

BITUMINOUS MACADAM.

North Lafayette..	East Fulton to Fountain.....	29	756	1477	2180	6249 00	6490 00	A. C. Sekell
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* Graded and graveled. ‡ To replace cedar blocks.

WORK LET FROM MAY 1, 1904 TO MAY 1, 1905.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

Pearl Alley.....	Campau to Grand River.....	16	236	.....	502	1258 00	1403 00	J. H. Sullivan
Crescent Avenue..	Canal to North Division.....	38	1033	Old	4950	9650 00	9985 00	J. McDermott & Son

REPORT OF BOARD OF PUBLIC WORKS

NOT COMPLETED.

STREET	EXTENT	DIMENSIONS				COST		CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount Paid on Contract	
East Bridge.....	At East Dock Line ..	.....	321	.....	845	\$1568 00	\$1791 00	Kloote & Vander Veen
West Bridge.....	At West Dock Line ..	44	150	.....	276	555 00	670 00	Kloote & Vander Veen
Cherry	South East to Carroll Avenue..	42	1840	Old	9390	12100 00	16890 00	Kloote & Vander Veen
Court House Alley	Kent to Ottawa ..	20	520	.....	438	2148 00	3470 00	Albert Prange
N. Ottawa Alley..	Lyon to Court House Alley ..	20	325	.....	690	7420 00	7790 00	Kloote & Vander Veen
Bridge St. Bridge	.. ..	44	471	945	2308			
ASPHALT BLOCK PAVEMENT								
North Union.	East Fulton to Lyon	30	1554	2968	4780	14380 00	14750 00	Kloote & Vander Veen
NOT COMPLETED.								
North Prospect...	Fountain to Crescent Avenue .	26	1253	2446	3254	9648 00	10163 00	J. McDermott & Son
CONCRETE PAVEMENT.								
Quigley Avenue...	South Division to Buchanan....	30	1250	.. ..	4548	6900 00	6415 00	Kloote & Vander Veen
GRADED, GRAVELED AND GUTTERS PAVED.								
South Fuller.....	Sherman to Fifth Avenue... ..	20	1253	None	.....	2260 00	2500 00	James B. Hoey
Pleasant.....	South College to South Union	30	593	1300	.....	2710 00	2913 00	City

NOT COMPLETED.

STREET	EXTENT	DIMENSIONS				COST		Amount Paid on Contract	CONTRACTORS.
		Width of Road-way	Length of Street	Length of Curb	No. of Square Yards	Contract Price	Amount of Roll		
Alger Avenue.....	Lake Avenue to Wealthy	24	906	.....	.....	.....	.....	.....	Decker & Jean
Caikins Avenue...	Lake Avenue to Buckeye.	30	455	878	.....	1787 00	1952 00	\$ 1495 00	F. M. Walworth
Earlton.	Lake Avenue to Cherry	26	355	712	.....	1595 00	1755 00	577 00	Kloote & Vander Veen
Fitzhugh.	East Fulton to Hermitage	30	585	1040	.....	2395 00	2590 00	809 00	Kloote & Vander Veen
Garden.....	Jefferson Ave. to S. Division.....	30	923	2006	.....	3949 00	4264 00	2779 00	James Sherlock
North Ionia.....	Fairbanks to Coldbrook.....	30	2516	5096	.....	10973 00	11300 00	4307 00	Albert Prange
Paris Avenue.. .	Adams to Oakdale Avenue.....	42	264	682	.....	2490 00	2600 00	.....	Kloote & Vander Veen
Thompson Court..	Pleasant to Sycamore.....	16	471	904	.. ....	1449 00	1650 00	.....	James Sherlock
South Union	East Fulton to Wealthy Ave.....	26	2576	5023	.....	8899 00	9250 00	7370 00	James B. Hoey

MILEAGE OF STREETS.

The mileage of streets in the city, and the length of each class of improvements are shown in the following table :

Graded and paved with sheet asphalt.	5.833
Graded and paved with block asphalt on gravel foundation	1.215
Graded and paved with block asphalt on concrete foundation.....	.230
Graded and paved with brick on concrete.....	9.410
Graded and macadamized.....	6.272
Graded and paved with tar concrete.....	.341
Graded and paved with cedar blocks on concrete....	4.304
Graded and paved with cedar blocks on plank.....	.184
Graded and paved with cedar blocks on gravel.....	1.870
Graded and paved with cedar blocks and cobble stones.....	1.838
Graded and paved with Portland cement concrete.....	.424
Graded and paved with cobble stones on gravel.....	.755
Graded, graveled and gutters paved with cobble stones....	82.537
Graded, graveled and gutters paved with brick.....	29.006
Graded and Graveled.....	29.891
Unimproved ...	113.087
Total.....	287.197

ROAD ROLLERS.

Rolling with the steam rollers began April 4, 1904, and work was suspended December 2, 1904.

The rollers were busy during the entire season and another roller could have been used a large portion of the time.

A small 20,000 pound macadam type of roller is needed for street repair, many of the old streets being too weak to support the heavier rollers. A roller of such weight could also be used to good advantage on contract work when not otherwise employed. The Common Council have practically authorized the purchase of such a machine, but owing to the small amount of work as yet ordered, it seems desirable to postpone its purchase.

The maintenance and operation is itemized as follows :

No. 1 KELLY ROLLER.

Maintenance—	Wages.....	\$ 32.51
	Parts and miscellaneous.....	30.94
Operation—	Wages.....	751.51
	Coal and kindling.....	405.00
	Supplies.....	45.12
Total.....		\$1,365.18

No. 2 KELLY-SPRINGFIELD ROLLER.

Maintenance—	Wages.....	\$ 25.82
	Parts and miscellaneous.....	32.26
Operation—	Wages.....	645.91
	Coal and kindling.....	304.62
	Supplies.....	80.58
Total.....		\$1,094.19

\$31.98 of the above maintenance account was paid by the Kelly Springfield Road Roller Co., under their guarantee.

No. 3 RUSSELL ROLLER.

Maintenance—	Wages.....	\$ 19.51
	Parts and miscellaneous.....	52.84
Operation—	Wages.....	747.86
	Coal and kindling.....	372.64
	Supplies.....	63.89
Total.....		\$1,256.73

No. 4 REISLER UNIVERSAL ROLLER.

Maintenance—	Wages.....	\$ 76.89
	Parts and miscellaneous.....	317.63
Operation—	Wages.....	659.60
	Coal and kindling.....	288.89
	Supplies.....	58.65
Total.....		\$1,441.66

SEWERS.

A beginning has been made toward removing the pollution of Grand River above the present water works intake. The contract for constructing the sewer from Howland street to Dean street was executed and the work nearly completed during 1904. This sewer will permit of all pollution being prevented on the east side

between the intake and the north city limits. The people having voted down the plan for a new water supply, steps should be taken at once to take care of the sewage from the Soldiers Home.

The only other sewer work of any size undertaken was the rebuilding of the trunk sewer in Ottawa and Island streets from Fulton street to Ionia street.

The construction was not commenced too soon, as the arch on a portion of the old sewer in Ottawa street fell in before the new portion was covered. The old sewer in Ottawa street, under the east curb was abandoned and filled up. The new portion was built in the center of the street.

The West Side ditch Sewer should be commenced the coming season without the pumping station if the additional expense is not thought desirable at this time. The lack of proper facilities for draining the western portion of the west side is very largely retarding its growth. No sewer can be laid or permanent improvements made in a large district that would otherwise rapidly build up. The same is likewise true of the property adjacent to Division street near the south city limits. With Silver Creek running through the valley to care for the surface water, a sanitary system, emptying into the Hilton street sewer, can readily be constructed at a reasonably low cost. Modern houses demand modern conveniences and these can not be secured without sewers.

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING APRIL 30, 1905.

The table following gives the location, kind and cost of sewers constructed during the year.

STREET	EXTENT	KINDS				COST		CONTRACTORS
		Inches	Length	Kind	Material	Contract Price	Amount of Roll	
Marion.....	Sibley to Chatham.....	9	438	.....	.....	497 00	508 00	Peter Van Ess
Garden.....	Jefferson to Vilas Avenues.....	9	403	.....	.....	361 00	441 00	Jas. Sherlock
Court Alley.....	Bowery, north 100 feet.....	9	303	.....	.....	259 00	327 00	Jacob Heerschap
South Ionia.....	Fifth to Sixth Avenues	8	220	.....	.....	529 75	344 00	Jacob Heerschap
Myrtle.....	Quarry to Hamilton Alley	18	158	.....	.....	2575 00	2770 00	John J. Rens
Quarry	North to Myrtle	18	564	.....	.....	.....	.....	.....
Earlton	Lake Avenue to Cherry.....	9	277	.....	.....	236 00	411 00	Peter Van Ess
North Union.....	Parkwood Avenue to Julia.....	9	318	.....	.....	273 00	344 00	Peter Van Ess
North East.....	East Bridge, north 1150 feet. ..	9	435	.....	.....	.....	.....	.....
Harvey	North East to Emerald Avenue.....	8	722	.....	.....	2650 00	3386 00	John J. Rens and Juc. Van Ess
Emerald Avenue	Harvey, north 900 feet.	8	355	.....	.....	.....	.....	.....
Thomas	Lot 59 Durham, 400 feet east.....	8	400	.....	.....	548 00	648 00	Peter De Witt
South Ottawa	East Fulton to Island.....	75	310	.....	.....	.....	.....	.....
Island	South Ottawa to South Ionia.....	48	507	.....	.....	16400 00	10800 00	Kloote & VanderVeen
Canal	Howland to Dean	40	887	.....	.....	14400 00	16100 00	Albert Prange
Alger Avenue.....	Lake to Wealthy Avenues	8	333	.....	.....	.....	.....	Decker & Jean
South Division	Island to Fulton Alley	12	180	.....	.....	.....	.....	City
Fulton Alley	Division to Sheldon	9	210	.....	.....	.....	964 25	.....

The above noted sewer work cost \$42,116.00. The work of the season increases the sewer system 2.255 miles.

The length of the sewers of the city is as follows :

Combined.....	181.383
Separate System { Sanitary.....	12.726
Storm.....	11.619

Composed of the following :

Brick.....	23.083
Vitrified pipe.....	119.507
Cement pipe.....	.100
Wrought Iron pipe.....	.160
Cast Iron pipe.....	.294
Concrete sewer.....	2.260
Concrete brick.....	.394
Total.....	145.728

In connection with this system there are 2,478 manholes.

WATER WORKS.

The work of laying mains provided for under the Extension bond issue was carried on as fast as the amount of help obtainable would permit. Mains were also laid in all streets being improved, the expense being borne by the Water Works fund. The mains and services were lowered in Ellsworth avenue, Grandville avenue, and South Union street from moneys furnished by the Common Council.

The pipe was furnished by the United States Cast Iron Pipe & Foundry Co., under the New England Water Works Association specifications, including dimensions. The pipe and specials were inspected at the foundry by Robert W. Hunt & Company, and an exceptionally good quality of pipe secured. Valves and hydrants were furnished by C. W. Thomas, Detroit. A

departure from recent practice was made in adopting the Detroit hydrant with a seven foot "bury." This permits of the dead water in the hydrant connection being well below all danger from frost. The extra cost of the longer hydrant will more than pay for itself in the reduced cost of maintenance.

From the Extension fund reinforcing mains were laid in Newberry street, Kent street and Lyon street, connecting with the main in Ottawa street. The line in Diamond, Sigsbee and Fuller streets was completed to Fifth avenue, near the proposed location of the stand-pipe. The East street main was extended from Hall street to Crofton avenue, giving much needed fire protection to property in that vicinity. The 16 inch main was completed in Union street and Hall street west to Terrace avenue, connecting up a number of dead ends and improving the pressure. On the West Side the mains in Front street and adjacent streets were completed north to near the junction. The laying of the main across the river will greatly improve the fire protection in this district.

The following is a detailed statement of receipts and disbursements of the Extension Fund to April 15th, 1906.

RECEIPTS				DISBURSEMENTS			
	Year Ending April 16th, 1904	Year Ending April 15th, 1906	TOTAL	PURPOSE	Year Ending April 16th, 1904	Year Ending April 15th, 1906	TOTAL
Bonds.....	\$ 80000 00	\$ 90000 00	\$ 170000 00	Material, Contract.....	\$ 60497 33	\$ 59643 37	\$ 110140 70
Interest	1767 61	.....	1767 61	" Cartage.....	1745 85	2116 45	3862 30
Material.	6 96	7300 16	7307 12	" Inspection ..	415 51	1191 93	1607 43
Transfer. ....	.....	27 50	27 50	" Printing. ..	89 29	155 84	245 13
				" Misc'ellaneous	22 62	2994 04	3016 66
				Laying, Contract.....	4774 55	7417 10	12191 65
				" Labor . ....	.....	13367 92	13367 92
				" Inspection...	887 34	745 09	1632 93
				" Printing....	15 30	14 76	30 06
				" Misc'ellaneous	.....	368 78	368 78
				Engineering.....	.....	23 00	23 00
				Tools.....	.....	34 76	34 76
				Standpipe	508 67	.....	508 67
				Interest and transfers.	1767 61	.....	1767 61
Receipts	\$ 81774 57	\$ 97387 66	\$ 179162 23		\$ 60719 57	\$ 88073 00	\$ 148792 60
Disbursements ..	60719 57	.....	148792 60		.....	.....	.....
On hand.....	\$ 21655 00	.....	\$ 30369 63				

Assets—

Cash on hand.....	\$30,369.63
Material furnished W. W....	8,444.74
Stock Inventory.....	7,071.77
	<u>\$45,886.14</u>

Liabilities—

General Fund	\$590.00
Water Works, use of tools	429 89
	<u>\$ 1019.89</u>
Net assets.....	<u>\$44,866.25</u>

The cost of lowering the mains and services in Union street, Ellsworth avenue, and Grandville avenue is shown in the following :

STREETS	MAINS	SERVICES	TOTAL
S. Union street.....	\$853.77	\$ 196.86	\$1050.63
Ellsworth avenue.....	681.13	497.77	1178.90
Grandville avenue.....	874.73	1041.19	1915.91
Total.....	\$2409.62	\$1735.82	\$4145.44

Below we give the mains laid and mains lowered during the year. Considerable work was done by day labor and such is indicated in the table. Later is given a table showing total miles of pipe in the Water Works system prior to May 1st, 1904, the amount laid between May 1st, 1904, and April 15th, 1905, the amount removed during the same time and the total April 15, 1905.

WATER MAINS.

STREET	EXTENT	Distance in feet from										DIAMETER IN INCHES					COST		
		E	W	N	S	Street Line	4	6	8	10	12	16	20	24	■		Material	Labor	Total
*Alger Avenue....	Lake to Wealthy Avenue	20	.....	.....	.....	.....	.....	888	.....	.....	.....	.....	.....	.....	.....	.....	531 12	324 81	855 93
*Antidel Court...	Lyon, north	12	.....	.....	.....	.....	260	.....	.....	.....	.....	.....	.....	.....	.....	.....	139 77	99 82	239 59
Baldwin	Packard to Dwight Avenue. .	15	.....	.....	.....	.....	1047	.....	.....	.....	.....	.....	.....	.....	.....	.....	564 21	439 13	1003 34
Bates	Fuller, west	30	.....	.....	.....	.....	707	.....	.....	.....	.....	.....	.....	.....	.....	.....	580 45	303 20	873 65
Broadway	Hamilton, south	25	.....	.....	.....	.....	.....	.....	.....	.....	412	.....	.....	.....	.....	.....	1289 19	400 14	1719 33
Butterworth Ave.	Ives Avenue, west	25	.....	.....	.....	.....	.....	324	.....	.....	.....	.....	.....	.....	.....	.....	939 85	117 83	1057 68
*Briggs Place....	Ames to Quincy	9	.....	.....	.....	.....	107	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 02	27	87 29
California	Jefferson to Straight	36	.....	.....	.....	.....	939	.....	.....	.....	.....	.....	.....	.....	.....	.....	711 64	464 67	1176 31
*Cole	Sweet to Marietta	25	.....	.....	.....	.....	648	.....	.....	.....	.....	.....	.....	.....	.....	.....	230 43	2 37	232 80
*Crescent Place..	East Bridge, south	7	.....	.....	.....	.....	327	.....	.....	.....	.....	.....	.....	.....	.....	.....	135 65	134 11	269 76
*Davis	Leonard to Myrtle	25	.....	.....	.....	.....	1161	.....	.....	.....	.....	.....	.....	.....	.....	.....	945 55	602 00	1547 55
*South Diamond..	Wealthy Avenue to Sigbee	54	.....	.....	.....	.....	.....	.....	.....	.....	.....	251	.....	.....	.....	.....	398 44	18 60	417 10
Dwight Avenue..	Baldwin to Orchard	25	.....	.....	.....	.....	.....	149	.....	.....	.....	.....	.....	.....	.....	.....	61 25	50 87	122 12
North East	East Bridge to Flat	25	.....	.....	.....	.....	.....	1857	.....	.....	.....	.....	.....	.....	.....	.....	1855 51	218 69	2074 20
*South East	Hall to Crofton Avenue	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2109 04	1453 51	4562 55
Earlton	Lake Avenue to Cherry	24	.....	.....	.....	.....	.....	419	.....	.....	.....	.....	.....	.....	.....	.....	250 59	201 56	452 15
*Ellsworth Ave..	East Fulton to Wealthy Ave. .	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1200 95	1421 38	2621 34
*Evergreen Ave..	South East, west	25	.....	.....	.....	.....	.....	302	.....	.....	.....	.....	.....	.....	.....	.....	78 19	64 67	142 86
Fitzhugh	East Fulton to Hermitage	25	.....	.....	.....	.....	.....	635	.....	.....	.....	.....	.....	.....	.....	.....	267 97	239 68	506 65
*North Forrest ..	Quincy to Sweet	20	.....	.....	.....	.....	.....	551	.....	.....	.....	.....	.....	.....	.....	.....	115 34	167 90	283 24

WATER MAINS—CONTINUED.

STREET	EXTENT	Distance in feet from					DIAMETER IN INCHES										COST				
		E	W	N	S	Street Lines	4	6	8	10	12	16	20	24	30	Material				Labor	Total
*North Front.....	Myrtle to Webster.....	25	..	..	..	..	..	..	..	..	500	..	..	..	..	818 78	511 48	1330 26			
North Front.....	Myrtle to south of Leonard.....	25	..	..	..	..	..	..	..	..	3000	..	..	..	..	3006 37	2104 00	5019 06			
*South Fuller..	Lake to Hope Avenues.....	25	..	..	..	..	..	..	500	..	..	..	..	..	..	548 08	226 11	773 14			
South Fuller.....	Sherman to Fifth Avenue.....	25	..	..	..	..	..	..	..	..	1218	..	..	..	..	2003 44	1083 54	3081 98			
*Gilder Court.....	Grandville Avenue, west.....	25	..	..	..	..	..	..	..	..	..	..	..	..	..	267 04	214 81	471 85			
Godfrey Avenue..	South Market, south.....	25	..	..	..	..	..	..	400	..	..	..	..	..	..	743 38	261 08	1104 44			
*Grandville Ave..	Ellsworth Avenue to Hall.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	743 09	59 27	802 36			
*Griggs Avenue ..	South Division to Jefferson.....	..	..	..	..	..	..	..	1010	..	..	..	..	..	..	380 81	743 97	1004 58			
Hall.....	South Union to Terrace.....	..	..	..	..	..	..	..	..	..	301 1322	..	..	..	..	3220 12	1547 08	4773 15			
Harlan.....	East Bridge to Flat.....	25	..	..	..	..	..	..	1940	..	..	..	..	..	..	1033 03	739 59	2229 22			
High.....	Grandville Avenue, east.....	..	..	..	..	..	..	..	150	..	..	..	..	..	..	404 84	347 31	681 45			
*Horton Avenue..	Griggs Avenue, south.....	25	..	..	..	..	..	..	130	..	..	..	..	..	..	148 02	108 99	240 94			
Hovey.....	Marion to Gurnison.....	..	..	..	..	..	..	..	1000	..	..	..	..	..	..	745 18	443 21	1159 39			
*Kent.....	Lyon to Newberry.....	20	..	..	..	..	..	..	..	..	..	..	..	1140 2225	..	12378 49	6429 02	19008 01			
Lilly.....	Grandville Avenue, west.....	..	..	..	..	..	..	..	315 223	..	..	..	..	..	..	352 73	223 53	581 26			
*Lyon.....	Kent to Ottawa.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1185 94	48 92	1237 76			
Lookwood.....	East, west.....	..	..	..	..	..	..	..	200	..	..	..	..	..	..	62 43	4 58	67 00			
Marion.....	Park Avenue to West Fulton.....	25	..	..	..	..	..	..	1200	..	..	..	..	..	..	1051 25	907 55	1959 20			
*South Market...	Godfrey Avenue, north.....	25	..	..	..	..	..	..	470	..	..	..	..	..	..	802 45	256 25	1158 70			
*Morris Avenue..	Pleasant to Logan.....	25	..	..	..	..	..	..	841	..	..	..	..	..	..	485 10	321 90	746 99			

REPORT OF BOARD OF PUBLIC WORKS

WATER MAINS—CONTINUED

STREET	EXTENT	Distance in feet					DIAMETER IN INCHES										COST		
		from					4	6	8	10	12	16	20	24	30	Material	Labor	Total	
		E	W	N	S	Street Line													
*Newberry.....	North Ionia to Kent.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1556 60	725 85	2415 45
North	Scribner to Broadway .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2072 94	136 37	2203 31
Packard.....	Baldwin to Lake Avenue .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	91 29	63 79	155 08
Park Avenue ..	South Lane Avenue to Marlon.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	512 94	302 30	815 64
Park Avenue ..	Ives Avenue, east .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	324 86	109 21	394 00
*Park Avenue ..	200 ft. east of Ives to Valley Av. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	311 55	309 41	620 90
*Pleasant	Madison to Morris Avenues.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	149 95	236 94	488 19
*Pleasant	Morris to S. College Avenues.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	304 22	22 65	326 88
*Pleasant	Paris Avenue to South Union.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	156 03	60 60	236 83
*Quigley Avenue..	South Division to Buchanan .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	572 35	390 37	968 98
*Quimby	North Lafayette to North Ave.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	350 16	8 88	259 04
*Rennselaer.....	White, west ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	196 35	169 03	365 43
Scribner.....	Webster to North .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1381 81	104 92	1586 73
Sheridan Avenue.	Hall, north.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1008 03	746 41	1755 07
*Sigsbee	Diamond to Fuller.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3311 53	1192 59	3940 12
Sibley	Marlon, west .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54 61	109 49	164 07
*Sweet.....	Plainfield to N. College Ave.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1038 59	794 26	1759 78
Thomas.....	South Fuller, west .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	223 08	311 81	535 49
South Union.....	Worden to Hall.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4113 18	1909 55	6033 03
South Union.....	Fulton to Wealthy .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44 13	819 73	863 86

MILES.

	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	24 in.	30 in.	36 in.	Hy- drants	Valves
Prior to 1904	40.556	56.754	19.811	7.045	14.723	0.230	6.088	0.749	1.853	1.660	.050	.019	1404	1324
Laid in 1904 .....	.428	3.938	1.378	.120	.619	.....	2.209	.....	.106	.267	.535	....	77	131
Totals.....	40.984	60.692	21.189	7.165	15.342	0.239	8.297	0.749	1.959	1.927	.585	.019	1481	1455
Removed... ..	436	1.005	.285	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	40.548	59.687	20.904	7.165	15.342	.239	8.297	.749	1.959	1.927	.585	.019	1481	1455

BRIDGES.

Practically all the bridge repairs consisted in rebuilding or repairing the ice breakers at Leonard street, Sixth street and Pearl street.

Concrete ice breakers, the nose being reinforced with a tee rail replaced the six old wooden breakers destroyed. The old wooden breaker on the east pier was repaired. The cost follows :

Labor.....	\$292.16
Material.....	407 68
Cartage.....	17.71
Tools.....	30 01
Engineering	17.90
Miscellaneous.....	2.30
Total...	<u>\$767.76</u>

The old wooden ice breakers at Sixth street were found in good condition up to about two feet below low water. The old material was removed to this elevation at all the piers and rebuilt with the old oak stringers removed by the Grand Rapids Railway from Bridge street Bridge. The breakers were refilled with hard-head stone. The cost follows :

Material.....	\$ 64.11
Labor.....	111.78
Cartage.....	7.28
Tools.....	.57
Engineering.....	5.50
Miscellaneous.....	.14
Total.....	<u>\$189.38</u>

The two west ice breakers at Pearl street were rebuilt with concrete at a cost as below :

Material.....	\$172.53
Labor . . .	174.06
Cartage	8.75
Tools... ..	.19
Engineering....	13.40
Miscellaneous.....	.50
Total	<u>\$369.43</u>

The sidewalk on Fulton street was repaired at a cost of \$9.68.

Plans were prepared and material has been ordered for reinforcing Leonard street bridge where the lower chord of the old lattice girder is crushing over the piers and abutments. The load will be distributed from the piers and butments by means of timber posts and steel tension bars. The structure is well preserved and with this reinforcing should give good service for from ten to fifteen years.

The cost to date is :

Material.....	\$45.83
Cartage.....	5.06
Engineering.....	57.00
<hr/>	
Total	\$107.89

Estimates for using the old Bridge street spans at Sweet street or Ann street, and the construction of an entirely new bridge at the same points were prepared, but no definite action has been taken looking to their construction.

The foundation to Coldbrook culvert where crossing Canal street, and under a portion of the Water Works Pumping Station grounds were repaired by facing the abutments with concrete, carrying the concrete down to rock. The cost follows :

Labor.....	\$164.68
Material.....	58 36
Engineering.....	3 00
Miscellaneous	1.20
<hr/>	
Total.....	\$227.24

BRIDGE STREET BRIDGE.

Bridge street Bridge was completed, excepting the sidewalks and paving, and opened for travel, late in October. With the completion of the walks and pavement, the city will have one of the best concrete-steel bridges in the country. Great credit is due Mr. J. P. Rusche for the manner in which the work was executed. As was expected, some repairs will be necessary to the railing where the expansion joints have not worked free. These repairs can be made at small cost.

The cost of the work for the past year and to date follows :

MAIN BRIDGE	Previous to May 1, '04	May 1, '04 to April 15, '05	TOTAL
Contract, and foot bridge, less deductions	\$36,542.00	\$50,758.00	\$87,300.00
Extras.....	46.34	276.94	323.28
Comfort station and subway.....	.. ....	842.53	842.53
Royalty.....	1,250.00	1,250.00	2,500.00
Inspection.....	465.30	441.10	906.40
Engineering.....	129.00	75.00	204.00
Printing and advertising.....	151.40	.....	151.40
Temporary sidewalk.....	.....	227.05	227.05
Maintaining roadway.....	.....	117.44	117.44
	\$38,584.04	\$53,988.06	\$92,572.10
APPROACHES	Previous to May 1, '04	May 1, '04 to April 15, '05	TOTAL
Previous to May 1st, 1903.....	\$ 973.39	.....	\$ 973.39
Teams and filling.....	141.30	\$153.10	294.40
Labor filling.....	220.28	284.83	505.11
Labor and material.....	1,990.10	861.66	2,851.76
Conduits.....	.....	172.85	172.85
Engineering.....	.....	4.00	4.00
Inspection.....	.... ..	20.00	20.00
Total for approaches.....	\$3,325.07	\$ 1,496.44	\$ 4,821.51
Total for main bridge.....	38,584.04.	53,988.06	92,572.10
Total,.....	\$41,909.11	\$55,484.50	\$97,393.61

WEALTHY AVE. BRIDGE.

Work on the substructure of Mr. Higgins' contract was delayed by high water until about the middle of May. Work was finally completed about the middle of August. The contract was completed for \$20,375.95. This amount includes a bill of \$338.87 for the Leitelt Iron Works for material and labor furnished Mr. Higgins before the city took charge of the work, and was of a

character to be of no value in the completion. Also a concrete mixer purchased for \$425.00 and sold for \$300.00, and a hoisting engine costing \$688.75 and now worth \$500.00. Allowing a credit for these three items, or \$1,138.87, the cost of the work executed by the city amounts to \$19,237.08. The piers were raised about two feet to bring the superstructure well above the high water of 1904.

The total cost of the substructure has been :

	Previons to May 1, '04	May 1, '04 to April 15, '05	TOTAL
Contract	\$17,577.83	\$5,677.91	\$23,255.24
Extras.....	.....	860.81	860 81
Engineering....	73.00	53.00	126.00
Inspection	39.55	186.00	225.55
Raising piers. ....	... ..	829.99	829 99
Total	\$17,689.88	\$7,607.71	\$25,297.59

The steel work of the superstructure was completed by the Milwaukee Bridge Co., about April 1st, 1905. This work was delayed by final approval of the shop plans, lack of material, and cars being snow bound at Ludington.

The roadway is paved with cresoted wood blocks on cresoted planks. The work of paving and painting was done by day labor.

The cost of the superstructure to date follows :

Contract estimate.....	\$29,051 32
Broadway { Material.....	2,678.72
{ Labor	116.48
Painting { Material.....	77.06
{ Labor.....	48.98
Adv. and Telegraphing.....	17 31
Cartage	115.83
Engineering.....	131.00
Inspection.....	604.61
Miscellaneous.....	18-95
Total....	\$25,860.26

Under date of July 18th, 1904, the City Attorney reported to the Common Council the decision of the Superior Court on the McKee injunction preventing the filling of the steamboat channel at Wealthy avenue. J. H. McKee & Son at the next meeting of the Council made a proposition tending toward a friendly settlement of all questions in controversy. Such agreement was not reached and accepted by both parties until Oct. 31st, 1904, and in the meantime the filling of the east approach could not proceed. About the middle of October the U. S. Government, through its local engineer, reconsidered its former action approving the filling of the steamboat channel and calling for an extra channel east of the east abutment then completed. Oct. 31st the Common Council authorized the construction of a concrete-steel arch which was immediately commenced by day labor. The abutments and most of the earth filling to grade is completed, ready for the construction of the arches as soon as the subsidence of the river will permit.

The cost of the arch is itemized as follows :

Labor.....	\$5,261.46
Sand, Gravel and Cement.....	1,078.48
Lumber.....	1,056.70
Steel and Iron.....	1,525.44
Nails, Bolts, etc. ..	60.82
Coal and Wood.....	306.48
Machinery.....	700.19
Tools.....	120.13
Cartage.....	178.23
Miscellaneous.....	74.90
Engineering	382.00
	<hr/>
	\$11,604.83
Deduction, Boots sold.	82.41
	<hr/>
	\$11,572.42

The approaches have been filled with material excavated in building operations as offered from time to time. The cost has averaged about twenty cents a load delivered, the city furnishing dumpers and spreaders. The cost of the approaches follows :

	Previous to May 1st, 1904	May 1st, '04 to Apr. 15, '05	TOTAL
East Approach.....	\$1,358.91	\$1,043.67	\$2,402.58
West Approach.....		420.63	420.63
Total.....	1,358.91	1,464.30	2,823.21

Total cost of Wealthy avenue bridge to date.

ITEM	Previous to May 1st, 1904	May 1, 1904 to Apr. 15, '05	TOTAL
Substructure.....	\$17,689.88	\$ 7,607.71	\$25,297.59
Superstructure		25,860.26	25,860.26
Arch.....		11,572.42	11,572.42
Approaches.....	1,358.91	1,464.30	2,823.21
Total.....	\$19,048.79	\$46,504.69	\$65,553.48

PERMITS FOR OPENING STREETS.

The Department continued the practice of doing all work in the streets in connection with sewer and water connections, until Dec. 31st, 1904. Since that date permits have been given licensed plumbers, and the work and the replacing of streets has been under careful inspection.

The street opening work started under trying conditions, shortly followed by a very severe winter; the methods were new, the employes inexperienced; the clerical help insufficient to properly handle the many details and accounts. As the work was finally organized, there

would have been very few complaints if those dealing with the lowering or thawing of services could have been eliminated. This being impossible, the action taken seemed advisable. The balance for the year April 15th, 1905, shows cash received \$49,050.94, disbursements \$48,322.34. Cash on hand, \$728.60; net gain, \$1,000.14, including tool house and tools. Considerable work remains to replace streets, opened late in the year, in proper condition.

Under the street opening work there were

Total orders written	2657
Orders cancelled.....	94
Total uncanceled orders	2563
Orders issued during preceeding year.....	1073
Orders issued during present year.....	1490

The later were divided as follows :

Sewer connections.....	168
Water connections.....	387
Sewer and Water connections.....	343
Lowering Services.....	299
Thaws and Repairs, Miscellaneous.....	363
Total.....	1490

Since permits have been granted plumbers, the following have been issued :

Sewer connections.....	31
Water connections.....	64
Sewer and Water connections	69
Miscellaneous repairs	124
Total.....	288

The receipts and disbursements follow :

Cash received for inspection on work.....	\$140.50	
Cash received for inspection on street.....	126.10	
Cash received for rolling.....	116.00	
Cash disbursed for inspection on work.....		\$104.36
Cash disbursed for car fare on work.....		5 50
	\$382.60	\$109.86
	100.86	
Balance on hand.....	\$272.74	

GAGING OF GRAND RIVER.

The following table shows the daily water levels at Fulton street bridge during the past year. All elevations refer to city datum.

Mr. Lyman E. Cooley, consulting engineer of Chicago, was retained to study the flood conditions of Grand River and make recommendations for future control. All available data was submitted, and after thorough consideration the following specific recommendations made :

1. A river 600 feet wide between dock lines south from the Grand Trunk Railway to some point between the two dams, with the bed of the river scalped down to such a level as not to raise the flood limit of 1904 when all water is constrained in the channel.

2. Such width between dock lines as now proposed (460 feet) between Bridge and Fulton streets, with a general betterment of hydraulic conditions, as by more regular sides and bottom and well shaped bridge piers few in number.

3. The closing of the over-flow sections on the north by embankments and the raising of the grade of Turner street below the viaduct above flood limits.

4. The unwatering of the west side by an embankment near the river on the south, the construction of a trunk sewer and a pumping station for the flood season.

5. To promote the radical improvement of the river below the city as the ultimate remedy for flood conditions in the lower river.

6. To conform all plans for the rapids and upper river to such policy as will permit the best development of water power and maintain the ruling conditions of flood flow.

Finally, to take a long sight ahead and guide public policy to a realization of all possible benefits in one season by a progressive development.

DAY	1904								1905			
	May	June	July	August	September	October	November	December	January	February	March	April
1	.....	1 70	0 10	0 02	0 50	0 50	0 25	0 15	.....	0 82	0 75	7 36
2	2 50	1 55	0 20	0 07	0 10	.....	0 15	0 15	.....	0 90	0 77	.....
3	2 30	1 40	.....	0 37	0 07	0 15	0 20	0 25	1 12	0 95	0 82	6 55
4	2 05	1 20	.....	0 47	.....	0 22	0 10	.....	1 10	0 90	0 70	6 12
5	1 00	.....	0 05	0 50	.....	.....	0 15	0 35	0 95	.....	.....	5 75
6	1 73	1 40	0 10	0 22	0 55	0 55	.....	0 25	0 75	1 05	0 70	5 40
7	1 55	1 15	0 13	.....	0 35	1 15	0 10	0 20	.....	1 10	0 65	5 10
8	.....	0 05	0 22	0 30	0 35	1 00	0 10	0 30	.....	1 30	0 65	4 82
9	1 45	0 80	0 10	0 05	0 30	.....	0 10	0 15	0 65	1 30	0 67	.....
10	1 55	0 65	.....	0 55	0 40	1 00	0 15	0 15	1 22	1 25	0 70	3 45
11	1 40	0 40	0 10	0 47	.....	1 37	0 05	.....	1 55	2 25	0 80	3 30
12	1 30	.....	0 05	0 65	0 40	1 40	0 10	0 30	1 60	.....	.....	2 95
13	1 20	0 30	0 35	0 65	0 37	1 50	.....	0 30	1 50	1 20	0 95	2 80
14	1 15	0 27	0 25	.....	0 47	1 37	0 15	0 10	1 15	1 35	.....	2 30
15	.....	0 15	0 30	0 55	0 45	1 32	0 07	0 10	.....	1 35	0 95	2 37
16	1 05	0 15	0 30	0 50	0 50	.....	0 17	0 10	1 15	1 40	.....	.....
17	1 05	0 05	.....	0 50	0 45	0 37	.....	0 10	1 15	1 15	0 95	1 85
18	0 95	0 15	0 30	0 55	.....	0 35	0 10	.....	1 05	1 30	0 05	1 55
19	1 15	.....	0 15	0 30	0 57	0 70	0 10	0 10	0 90	.....	7 20	1 40
20	1 55	0 15	0 30	0 30	0 25	0 55	.....	0 10	0 80	1 30	2 30	1 40
21	2 00	.....	0 25	.....	1 15	1 15	0 10	0 10	0 65	0 95	2 22	1 70
22	.....	.....	0 30	0 20	0 37	0 30	0 10	0 15	.....	.....	2 52	2 55
23	5 00	0 42	0 40	0 25	0 25	.....	.....	0 12	0 45	0 90	2 35	.....
24	5 30	0 45	.....	0 10	0 15	0 52	.....	0 10	0 45	.....	10 30	2 37
25	4 55	0 00	0 40	0 05	.....	0 60	0 12	.....	0 60	0 30	11 25	2 52
26	3 25	.....	0 55	0 10	0 70	0 45	0 10	.....	0 60	0 65	12 15	2 32
27	3 35	0 15	0 53	0 15	0 90	0 42	.....	0 17	0 70	0 70	12 20	2 32
28	3 00	0 15	0 40	.....	0 75	0 40	0 25	0 45	0 70	0 75	11 52	2 70
29	.....	0 00	0 50	0 22	1 00	0 35	0 15	1 25	.....	.....	10 42	2 55
30	.....	0 10	0 60	0 45	0 65	.....	0 15	1 20	0 95	.....	9 57	.....
31	2 10	.....	.....	0 55	.....	0 10	.....	1 05	0 75	.....	8 65	.....

COST OF PUBLIC IMPROVEMENTS.

Cost of street improvements, \$114,413 00, upon which has been paid.....	\$ 17,397.00
Paid in settlement of all work	208,201.00
Cost of sewers.....	42,116.00
Cost of bridge repairs.....	1,002.00
Cost of new bridges.....	101,989.00
Water Works extension mains.....	95,761.00
Total.....	<u>\$467,126.00</u>

EXPENSES.

Salaries (charged to general Fund).....	\$10,208.90
Salaries (charged to Special Improvements).....	4,729.35
Inspection.....	7,225.35
Postage and express.....	120.20
Library.....	31.50
Printing.....	174.85
Telephone and telegraph	24.25
Stationery.....	170.55
Typewriter supplies.....	.75
Blue prints and tracing	72.40
Maps.....	4.47
Car fare.....	400.00
Livery.....	270.50
Miscellaneous, office.....	155.95
Miscellaneous, drafting room.....	63.47
Miscellaneous, field.....	306.86
Miscellaneous, repairs.....	7.64
Total.....	<u>\$24,038.14</u>

The lage amount of extra additional work, including investigation of flood conditions, and street opening work, as well as the normal increase in the work of the Department where so much work is under way or being planned, had increased the number of employes and the general expenses. The large increase in miscellaneous supplies is occasioned by the Department occupying the offices formally used by the Library, and the purchase of new field instruments.

The employes have worked enthusiastically, many working overtime to promptly complete their work.

Respectfully submitted,

L. W. ANDERSON,

City Engineer.

Board of Public Works

1911-1912

COMMON COUNCIL

1911-1912

City of Grand Rapids, Mich.

SMITTING THE REPORTS OF THE SECRETARY AND
GENERAL MANAGER CITY ENGINEER CHIEF
CLERK AND CHIEF INSPECTOR

1911-1912



THIRTY-THIRD
ANNUAL REPORT

OF THE

Board of Public Works

TO THE

COMMON COUNCIL

OF THE

City of Grand Rapids, Mich.

**TRANSMITTING THE REPORTS OF THE SECRETARY AND
GENERAL MANAGER, CITY ENGINEER, CHIEF
CLERK AND CHIEF INSPECTOR**

FOR THE

YEAR ENDING MARCH 31, 1906.

**GRAND RAPIDS, MICH.:
PRESS OF WEST MICHIGAN PRINTING CO.**

1907.

THE NEW YORK
LIBRARY
1007

REPORT

OF THE

BOARD OF PUBLIC WORKS.

GRAND RAPIDS, MICH., Dec. 14, 1906.

To the Honorable Common Council:

GENTLEMEN:—Herewith are transmitted Annual Reports from the Departments of the Municipal Government under the jurisdiction of this Board, also inventories covering the Water Works and Electric Lighting systems and City Bridges.

Respectfully submitted.

JAMES E. KEEGAN, President.

GEORGE C. PEIRCE,

CHARLES M. WILSON,

CHARLES A. GREENMAN,

HENRY J. KLEVORN,

GEORGE E. ELLIS, Mayor.

REPORT OF SECRETARY AND GENERAL MANAGER.

OFFICE OF THE BOARD OF PUBLIC WORKS }
Grand Rapids, Mich., Dec. 14, 1906. }

To the Honorable The Board of Public Works :

GENTLEMEN:—We respectfully submit to your Honorable Body a resume of the work accomplished by the several Departments of the City Government under your jurisdiction, for the year ending March 31, 1906, viz :

Annual statements covering Water Works System, Electric Lighting System and Engineering Department.

Inventories covering Water Works and Electric Lighting Systems and Bridges.

The annual statements are given in detail and are self explanatory. The inventories have been the cause of delaying this Report as we wished to combine same with the Annual Statements. The results of the inventories are as follows :

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATION



TURNER STREET SUBWAY
View Looking South

WATER WORKS.

TOTAL INVESTMENT AS SHOWN BY BOOKS.

Distributed as follows.		Charged off.	Removed.
Water mains	\$1,168,795 52	\$40,662 04	\$133,134 21
Pumping Station (property).....	70,218 26	16,708 69	289 39
Pumping Station (machinery)....	207,120 01	71,280 67	31,433 99
Reservoirs.....	113,330 66	26,017 81	28,700 10
Intakes.....	29,280 72	3,179 25	18,831 08
Standpipe	13,150 03	5,165 77	
Meters and connections.....	79,248 61	7,924 86	
Surveys, engineering, etc., on new water supply.....	12,805 26	12,805 26	
Miscellaneous maintenance amounts improperly charged and classified	46,976 63	46,976 63	
Totals	\$1,740,925 70	\$230,720 98	\$212,380 77

PRESENT VALUES.

Water mains.....	\$991,999 27
Pumping station (property).....	53,228 18
Pumping station (machinery).....	104,405 35
Reservoirs	58,612 75
Intakes.....	7,270 39
Standpipe.....	7,984 26
Meters and connections.....	71,323 75
Total.....	\$1,297,823 95

SUPPLIES AND TOOLS.

Pumping station.....	\$913 62
Repair shops.....	3,771 41
Stock on hand (storeroom).....	14,557 70

You will please notice that the total value of the Water Works System according to the book account is

\$1,740,925.70 and that the depreciation, discarded apparatus, etc., amounts to \$443,101.75, leaving an actual value of \$1,297,823.95.

ELECTRIC LIGHTING SYSTEM.

The book value of the Electric Lighting System on March

31, 1906, was.....	\$210,646 96
We have charged off for depreciation.....	41,949 53
Leaving an actual value of.....	168,697 43

BRIDGES.

Original cost.....	\$343,927 00
Depreciation	54,641 42
Remaining value.....	289,285 58

The large amount charged off from the Water Works properties is due principally to the old wooden water pipe, boilers and engines which were discarded long ago and have been carried on the books at their original costs.

There are also a few such items in the Electric Lighting Department, but the bulk of the amount charged off for depreciation on these properties is for natural wear and tear and on account of the initial cost of electrical apparatus being less than when the system was installed.

The total costs per lamp per annum for operating the Electric Lighting Department (including fixed charges, etc.) are as follows:

Maintenance and operation.....	\$32 56
Loss through non-taxation.....	3 26
Depreciation	11 00
Bond interest.....	6 88
Interest on balance of investment which was raised through general taxes.....	4 72
Total per lamp per annum.....	<u>\$58 42</u>

Just prior to the installation of the Municipal Lighting System the City was paying a private corporation \$97.00 per lamp per annum.

For the kind and courteous co-operation of your Honorable Body and for the loyal performance of duty on the part of the heads of departments and all employes of this Board, acknowledgement is hereby given.

Respectfully submitted,

SAMUEL A. FRESHNEY,
Secretary and General Manager.

SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR :—Herewith is presented Annual Report of the Water Works System and Lighting Plant showing the cost of operation and maintenance of the Pumping Station, Lighting Plant and Water Works System; also financial statements pertaining thereto.

WATER WORKS FUND.

Annual statement of receipts and expenditures for eleven and one-half months ending March 31, 1906.

RECEIPTS.

For water rates and fines.....	\$ 141,476 96
For water permits.....	1,682 50
For plumber's licences.....	400 00
For material sold.....	7,873 07
	<hr/>
	\$ 151,432 53
The total income of this department from beginning of collection to April 15, 1905.....	\$1,864,355 58
	<hr/>
Total income to date.....	\$2,015,788 11

DISBURSEMENTS.**STATION.**

Superintendence.....	\$ 507 26	
Clerk.....	418 44	
Engineers.....	2,772 46	
Firemen, oilers, etc.....	5,532 42	
Buildings and Grounds.....	427 17	
Engines.....	484 93	
Boilers.....	476 70	
Auxiliary Machinery.....	18 36	
Coal.....	16,711 93	
Oils.....	663 68	
Waste.....	349 08	
Supplies and tools.....	1,286 95	
		\$ 29,649 33

DISTRIBUTION.

Superintendence.....	\$ 639 41	
Clerk.....	127 86	
Repairing and lowering mains.....	8,736 65	
Reading meters.....	1,508 99	
Repairing meters.....	2,583 89	
Supplies and tools.....	1,422 13	
Stables.....	1,183 24	
Reservoir.....	40 43	
Standpipe.....	17 11	
Fire Hydrants.....	1,809 08	
Sprinkling cranes.....	123 65	
Street valves.....	238 18	
Services.....	1,941 39	
Shop and storehouse.....	929 67	
		\$ 21,301 68

INSPECTORS.

Chief inspector and three assistants.....	3,703 50	
Stables.....	201 67	
Car tickets.....	79 00	
Supplies.....	14 72	
Telephones.....	18 00	
		\$ 4,016.89

OFFICE.

Two bookkeepers, cashier and two assistants.....	\$ 2,186 54	
Books, blanks and stationery.....	485 73	
Postage.....	65 35	
Telephone.....	12 00	
Advertising.....	4 50	
Office supplies.....	99 42	
		\$ 2,853 54

CONSTRUCTION.

Buildings and Grounds	133 30	
Machinery	149 31	
New water mains	24,718 57	
New water meters	1,926 30	
Setting water meters	1,772 06	
New supplies	53 75	
		<hr/>
		\$ 28 753 29
Paid during past year (Water Works extension fund)	25,503 53	
		<hr/>
Total paid construction account during past year	\$ 51,256 81	
Paid previous to April 15, 1905	1,686,668 89	
		<hr/>
Total investment as shown by book to date	\$1,740,925 70	

DEDUCTIONS :

Mains and machinery abandoned and removed since the year

1873.....	\$ 212,380 77
Depreciation (as per tables following).....	170,939 09
Surveys, engineering, etc., on new water supply.....	12,805 26
Miscellaneous maintenance accounts.....	46,976 63

\$ 443,101 75

Present values as shown by inventory..... 1,297,823 95

SUPPLIES AND TOOLS :

Pumping station.....	943 62
Repair shops.....	3,771 41
Storeroom.....	14,557 70

INTEREST AND EXCHANGE.

Paid from Water Works fund up to September 1, 1905	27,615 35
Paid from Water Works sinking fund, Sept. 1, '05 to Mar 31, '06	17,987 89
	<hr/>
Total amount of interest paid	\$ 45,603 24

SINKING FUND.

Deposited with sinking fund to March 31, 1906	30,458 60
--	-----------

RECAPITULATION.**FOR MAINTENANCE AND OPERATION :**

Station.....	\$ 29,649 38
Distribution.....	21,301 68
Inspection department.....	4,016 89
Office.....	2,853 54
	<hr/>
Total for maintenance and operation	\$ 57,821 49
Total for construction	28,753 29
Total for exchange and interest (to September 1, 1905)	27,615 35
Total for exchange and interest (from September 1 to March 31, 1906 paid from sinking fund)	17,987 89
	<hr/>
Total disbursements for the year	\$ 132,178 02

Total paid for maintenance and operation previous to April 15,		
1905.....	\$	993,794 66
Miscellaneous maintenance accounts transferred from investment account.....		
		59,781 89
Paid during the past year.....		57,821 49
		<hr/>
Total paid for maintenance and operation to date.....		\$1,111,398 04
Cash on hand April 15, 1905.....	\$	594 69
Receipts during the year.....		151,432 53
Disbursements during the past year.....		132,178 02
Cash on hand (Water Works fund) March 31.....		7,378 37
Cash on hand (Water Works sinking fund) March 31.....		12,470 83
		<hr/>
		152,027 22 \$ 152,027 22

WATER WORKS BONDS AND INTEREST.

Series	Due	Date of Issue	Date of Maturity	Com. and Ex.	Principal	Rate	Int. and Ex.	Total
Fourth	Sept. 1	September, 1888	September, 1908	\$ 7 50	\$150,000 00	5 %	\$3,757 50	\$ 7,515 00
	Mar. 1			7 50			3,757 50	
Fifth	May 1	May, 1889	May, 1909	4 00	80,000 00	5 %	2,004 00	4,008 00
	Nov. 1			4 00			2,004 00	
Sixth	Jan, 1	January, 1892	January, 1912	13 50	300,000 00	4½%	6,763 50	13,527 00
	July			13 50			6,763 50	
Refn'd	Oct. 1	October, 1893	October, 1913	10 12	225,000 00	4½%	5,072 62	10,145 24
First	Apr. 1			10 12			5,072 62	
Refn'd	June 1	June, 1895	June, 1915	4 00	100,000 00	4 %	2,004 00	4,008 00
Second	Dec. 1			4 00			2,004 00	
Ninth	July 1	July, 1903	July, 1923		80,000 00	3½%	1,400 00	2,800 00
	Jan. 1						1,400 00	
Tenth	July 1	July, 1904	July, 1924		90,000 00	4 %	1,800 00	3,600 00
	Jan. 1						1,800 00	
					\$1,025,000 00			\$45,603 24

LIGHTING PLANT.

ANNUAL STATEMENT YEAR ENDING MARCH 31, 1906.

OPERATION.

RECEIPTS.

Budget appropriation.....	\$30,000 00
Material sold.....	701 80
	<hr/>
	\$30.701 80

DISBURSEMENTS.

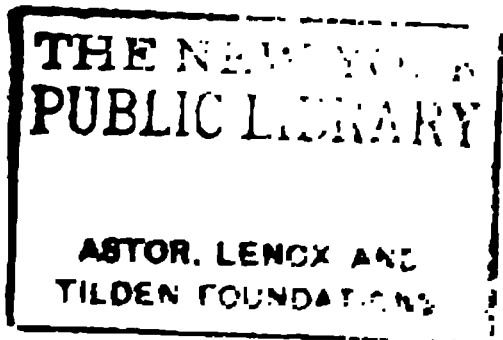
GENERAL.

Payment of loan to general fund.....	\$ 1,409 82
--------------------------------------	-------------

STATION.

Superintendence.....	\$ 768 31
Clerk	479 81
Engineers.....	2,203 99
Firemen, helpers, etc.....	2,013 20
Dynamo-tenders	1,220 51
Trimmers and linemen	2,921 08
Buildings and grounds.....	285 69
Engines.....	348 62
Boilers.....	442 27
Coal.....	8,611 06
Waste.....	126 93
Dynamos.....	63 64
Switchboard.....	25 10
Supplies and tools	692 38
Miscellaneous.....	19 25
Oils.....	345 82
	<hr/>

20,567 16





CONCRETE STEEL ARCH

East Approach to Wealthy Avenue Bridge. View from the South

DISTRIBUTION.

Lines and Cables.....	\$ 225 25	
Conduits.....	44 08	
Lamp Posts.....	2 70	
Towers.....	7 20	
Lamps.....	1,201 69	
Globes.....	1,048 75	
Carbons.....	531 70	
Trimming.....	25 34	
Stables.....	337 65	
Miscellaneous.....	15 20	
		<hr/>
		3,442 56

OFFICE.

Clerk.....	\$ 80 00	
Printing and stationery.....	20 10	
		<hr/>
		100 10
Total disbursements.....	\$ 25,519 64	
Balance March 31, 1906.....	5,181 66	
		<hr/>
Totals, equals receipts.....	\$ 30,701 30	

EXTENSION FUND.

Budget appropriation	\$ 5,500 00
----------------------------	-------------

DISBURSEMENTS.

Lamps.....	\$ 1,153 79	
Wire and Cables.....	1,849 84	
Labor.....	1,108 91	
Line supplies.....	516 53	
Ammeters.....	131 00	
		<hr/>
Total disbursements.....	\$ 4,760 07	
Balance March 31, 1906	739 93	
		<hr/>
Totals equals receipts.....	\$ 5,500 00	

REPAIRING TOWER FUND.

Budget appropriation	500 00
No disbursements.....	
Balance March 31, 1906.....	500 00

AGGREGATE OF BALANCE.

Operation.....	5,181 66
Extension.....	739 93
Tower repairs.....	500 00
Total balance in fund.....	<u>\$ 6,421 59</u>

LIGHTING PLANT.

Total amount paid for construction previous to April 15, 1905,...	\$205,886.89
“ “ “ “ “ during past year,.....	<u>4,760.07</u>
“ “ “ “ “ to date,.....	\$210,646.96
Less depreciation per inventory,.....	<u>41,949.53</u>
Present value of Plant,.....	\$168,697.43

INVENTORY.

Engines,	\$ 15,739.10
Boilers,	17,697.22
Crane,	1,885.47
Dynamos and connections,	14,232.12
Building,.....	43,922 39
Towers,	9,701.69
Lines and cables,	64,683.95
Supplies,	<u>1,335.49</u>
	\$168,697.43
Supplies and tools "Station,"	\$ 2,163.77

The Bonded indebtedness is \$125,000.00 and the interest and exchange for the past year amounted to \$5,007.00, the \$7.00 being for exchange and commission.

LIGHTING MUNICIPAL BUILDING.

ANNUAL STATEMENT OF RECEIPTS AND DISBURSMENTS ENDING MARCH 31, 1906.

	Receipts		Disbursements		
	1905	1906		1905	1906
Appropriation	\$ 5,000.00	\$ 4,000.00	Advertising	\$ 61 95	.....
			Specifications	1.75	.....
			Telegrams. etc. ...	.64	.....
			Wiring city engi- neer's office	175.00	.....
			Foundation and Installation ....	.....	\$ 354.39
			Freight & cartage	.....	4.66
			Electric fixtures etc. ....	.....	13.37
			Engineering .....	.....	40.00
			Estimate No 1 on engine & gen- erator contract .	.....	1,184.66
Totals,	\$ 5,000.00	\$ 4,000.00		\$ 239.34	\$ 1,619.81

RECAPITULATION.

Budget Appropriation 1905 and 1906,		\$ 9,000.00
Disbursements, 1905 and 1906,	\$ 1,859.15	
Balance on hand March 31st, 1906,	7,140.85	
	<u>\$ 9,000.00</u>	<u>\$ 9,000.00</u>
Accounts payable: balance on engine and generator,		\$ 2,378.22

GAS TESTING FUND.

ANNUAL STATEMENT OF RECEIPTS AND DISBURSEMENTS, ENDING MARCH 31, 1906.

Budget Appropriation, \$2,000.00

DISBURSEMENTS.

Meter prover,	\$ 125.00
Pressure gages,	15.10
Recording pressure gage,	46.30
Cartage,	1.25
	\$ 187.65
Balance on hand March 31st, 1906,	1,812.35
	\$ 2,000.00 \$ 2,000.00

SUMMARY.

ANNUAL STATEMENT OF OPERATION OF CITY LIGHTING PLANT, YEAR ENDING MARCH 31, 1906, (348 days)

	Total cost	Aver. cost per day	Aver. cost per lamp per day	Aver. cost per kilo- watt hour
Coal.....	\$ 8,400 48	\$24 14	.0332645	.0072881
Wages.....	10,809 72	29 62	.0408159	.0089431
Carbons	780 08	2 24	.0030868	.0006761
Globes	785 94	2 26	.0031143	.0006821
Repairs	1,578 06	4 54	.0062562	.0013702
Supplies	2,028 03	5 83	.0080337	.0017601
Oils	431 32	1 24	.0017088	.0003741
Totals.....	\$24,313 63	\$69 87	.0962802	.0210938

Plant operated 348 days, shut down 2 days in June, 1905, on account of high water in Grand River.

Total pounds of coal consumed.....	6,892,927	
Average pounds consumed per day.....	19,543	
Average cost of coal per 2,000 lbs		\$ 2,436
Average kilo-watt hours per day	3,312	
Average number of lamps on circuit per day.....	731	
Average number of lamps reported out per day.....	5	
Average number of lamps operated per day.....	726	
Average number of hours operated per day....	10:30	
Aver. cost per lamp per year computed on above basis		\$35 14

COMPARATIVE STATEMENT.

	1901-02	1902-03	1903-04	1904-05	1905-06
No. of lamps operated...	531	578	623	687	726
Average cost per lamp per year.....	\$40 99	\$43 40	\$43 85	\$40 86	\$35 14

Contract price before plant was built was, in first contract \$120.00 per lamp per year. In second contract, \$107.00 per lamp per year. Contract price just prior to the installation of the Municipal Plant was \$97.00 per lamp per year.

SUMMARY.

ANNUAL STATEMENT OF OPERATION OF CITY PUMPING STATION, YEAR ENDING MARCH 31, 1906. (350 DAYS)

	Total cost of	Average cost per day of	Average cost per 1,000,000 gals. of
Coal,	\$ 15,757.94	\$ 45.02	\$ 3.63
Wages,	9,189.47	26.26	2.12
Supplies,	1,502.54	4.29	.35
Repairs,	1,141.45	3.26	.26
Oils and grease,	551.04	1.58	.12
Totals,	\$ 28,142.44	\$ 80.41	\$ 6.48

Total pounds of coal consumed,	11,819,581
Average pounds consumed per day,	33,770
Average cost of coal per 2000 pounds,	\$ 2.67

COMPARATIVE STATEMENT.

	1902-03	1903-04	1904-05	1905-06
Aver gallons of water pumped,	12,215,973	14,092,458	13,986,651	12,404,970
Aver. cost to pump 1,000,000 gallons,...	\$ 7 37	\$ 7.59	\$ 7.00	\$ 6.48

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.



WEALTHY AVENUE BRIDGE

View from East Side of Grand River. Showing Concrete Steel Arch

WATER REPORT.

Table showing the amount of water pumped into the High and Low Services for the year ending March 31, 1906, and the total pumping record.

	LOW SERVICE			HIGH SERVICE	
	Total gallons pumped per month	Avg. gallons pumped per day	Total gallons pumped per month	Avg. gallons pumped per day	Total gallons pumped per month
April (15 days).....	156,857,804	10,457,154	85,996,866	5,733,125	70,860,488
May	337,152,777	10,875,896	185,026,405	5,863,152	152,126,812
June	402,504,276	13,416,809	232,824,594	7,760,819	169,679,692
July	402,080,377	12,970,335	224,266,125	7,234,391	177,814,252
August.....	403,772,194	13,024,909	230,384,778	7,431,767	173,987,410
September	389,409,957	12,980,333	227,230,579	7,574,353	162,179,378
October	330,218,821	12,265,123	223,891,123	7,222,294	156,327,088
November	349,536,163	11,651,205	207,035,063	6,901,169	142,501,100
December	364,639,246	11,762,556	209,557,702	6,759,926	155,081,544
January	363,702,515	11,833,630	209,790,050	6,767,441	158,911,856
February	382,812,118	13,671,861	207,860,246	7,423,580	174,951,872
March	404,053,721	13,033,991	206,916,567	6,674,728	197,137,154
Totals.....	4,341,739,469	.....	2,450,780,767	.....	1,890,958,702
Averages.....	.....	12,404,970	.....	7,002,231	.....
					5,402,739

DETAILED STATEMENT OF CONSTRUCTION AND DISTRIBUTION 1905 AND 1906.

CONSTRUCTION.

Mains tested	29	
Special connections, (fire services)	9	
Post indicators set	1	
	<hr/>	
Extension of mains		\$ 24,718.57
New meters		1,926.30
Meters set	395	
Concrete meter boxes set	192	
Wooden meter boxes set	8	
	<hr/>	
		1,772.06
New machinery		149.31
Buildings and grounds		133.30
New supplies		53.75
		<hr/>
Total disbursements		\$ 28,753.29

DISTRIBUTION.

Superintendence		\$ 639.41
Clerk		127.86
Supplies and tools		1,422.13
Shop and storeroom		929.67
Stables		1,183.24
Leaks in mains repaired	36	
Mains tested	18	
Lowering water mains		
Post indicator repaired	1	
	<hr/>	
		\$ 8,736.65
Meters read	27,574	1,508.99
	<hr/>	
Meters taken out	880	
" reset	360	
" repaired	1,151	
" packed to prevent freezing	250	

Meters put in scrap.....	15	
Patent meter boxes repaired.....	94	
Concrete meter boxes repaired.....	9	
Wooden " " "	3	
Patent meter boxes taken out	154	
Concrete " " " "	1	
Wooden " " " "	9	
Meters moved.....	4	
		\$ 2,583.89
Repairs and inspections at reservoir.....		40.43
Repairs " " " standpipe.....		17.11
Sprinkling cranes erected.....	18	
" " taken down.....	24	
" " repaired.....	9	
" " moved	5	
		123.65
Street valves set	1	
Street valves repaired	40	
Street valve boxes repaired.....	33	
		238.18
Services forced out....	51	
" inspected	110	
" repaired.....	27	
" turned off.....	279	
" turned on	141	
" turned off at main.....	61	
" boxes repaired.....	28	
" connected	10	
" extended	14	
" lowered	1	
2 inch taps made.....	1	
1 " " "	22	
$\frac{3}{4}$ " " "	21	
$\frac{5}{8}$ " " "	194	
$\frac{1}{2}$ " " "	484	
$\frac{3}{4}$ inch retaps made.....	17	
$\frac{5}{8}$ " " "	54	
$\frac{1}{2}$ " " "	100	
Watering troughs adjusted.....	57	
		1,941.39

Fire hydrants thawed out	304	
“ “ pumped out.....	322	
“ “ repaired	1,568	
“ “ moved	7	
“ “ blown off	24	
“ “ replaced	1	1,809.08
		<hr/>
Total.....		\$ 21,301.68

Respectfully submitted,
JAS. A. KINNEY,
Chief Clerk.

ANNUAL REPORT OF INSPECTION
DEPARTMENT.

Grand Rapids, Mich., April 1, 1906.

MR. SAMUEL A. FRESHNEY,
*Secretary and General Manager, Board of Public
Works.*

DEAR SIR:

Herewith is presented the Annual Report of
the Inspection Department for the year ending March
31, 1906.

WATER SERVICES.

Number of schedule services.....	9,710
“ “ metered services	4,071
“ “ services to curb or lot line only	564
“ “ “ for fire protection	125
“ “ “ “ elevators	25
“ “ “ “ water troughs	50
Total	14,545

DISTRIBUTED AS FOLLOWS, IN THE THREE DISTRICTS:

NORTH DISTRICT.

Schedule	3,514
Metered	1,387
To curb or lot line.....	215
Total	5,116

SOUTH DISTRICT.

Schedule	3,721
Metered	1,431
To curb or lot line.....	313
Total	5,465

WEST DISTRICT.

Schedule	2,475
Metered	1,253
To curb or lot line.....	36
Total	3,764
Total number of private meters in service	867
“ “ “ services cut off at main and abandoned	242
“ “ “ “ discontinued and gone to Hydraulic Co. ..	149
“ “ “ permits issued Apr. 15-'05 to Apr. 1-'06.....	672

On the services which are metered no record is kept of the fixtures.

Embodied in the following statement is a report of the work done by the inspectors employed in this department during the past year:

Number of house inspections made.....	2,492
“ “ inspections and investigations made and notices served.	12,736
“ “ meter readings.....	27,574
“ “ water services to curb inspected.....	310
“ “ high reading meter notices	1,262
“ “ water waste notices served	482
“ “ notices to property owners to make water connections.	325
“ “ leaks found and owners notified.....	964
“ “ services turned on	767
“ “ services turned off.....	915
“ “ fixtures capped and uncapped.....	25
“ “ Hopper closet permits granted.....	128
“ “ Hopper closet permits denied.....	4
“ “ reports of Chief Inspector to Board.....	125

METERS.

In the following table are shown the number, kind, and size of meters in service on March 31, 1906:

METERS IN SERVICE, APRIL 1906.

	5/8 in.	3/4 in.	1 in.	1 1/4 in.	2 in.	3 in.	4 in.	6 in.	Totals
Nash,.....	1,673	104	46	3	9	.....	1	.....	1,836
Worthington..	209	18	42	.....	16	.....	1	.....	286
Crown	1,219	153	89	1	25	1	3	1	1,492
Thomson	1	1	.....	.....	1	.....	.....	.....	3
Trident	202	5	3	2	.....	.....	1	.....	213
Union Rotary	1	2	.....	4	.....	1	.....	.....	8
Duplex	5	.....	.....	.....	.....	.....	.....	.....	5
Gem.....	.....	.....	.....	.....	4	6	15	1	26
Hersey	8	6	19	.....	5	.....	.....	.....	38
Lambert.....	10	3	.....	.....	.....	.....	.....	.....	13
Keystone ..	2	....	.....	.....	.....	.....	.....	.....	2
Empire	94	84	6	.....	15	.....	.....	... ..	149
Totals ...	3,424	326	205	10	75	8	21	2	4,071

WATER FIXTURES ON SCHEDULE SERVICES.

Baths.....	2,841
Hopper Closets.....	1,954
Tank Closets.....	5,849
Basins	2,624
Kitchen sinks.....	4,031
Urinals.....	49
Yard hydrants	5,233
Sill cocks.....	6,215
Hydraulic Pumps.....	350
Water troughs	50
Sprinkling cranes.....	27
Miscellaneous fixtures.....	611
Total.....	29,834

Distributed in the several districts as shown in the following tables :

WARDS	BATHS	Hopper Closets	Tank Closets	BASINS	SINKS
First and twelfth.....	200	135	408	180	336
Tenth and eleventh.....	920	411	1,678	788	1,049
Third.....	656	411	1,341	680	937
Second, fourth and fifth.....	640	427	1,410	635	1,101
Sixth and seventh.....	247	444	624	190	375
Eighth and ninth.....	160	126	354	129	206
Engine houses.....	18	.....	24	18	23
Parks.....	.....	.....	.....	.....	.....
Cemeteries.....	.....	.....	10	4	4
Grand total.....	2,841	1,954	5,849	2,624	4,031

WARDS	Uri- nals	Hy- drants	Sill Cocks	Hydral'c Pumps	Water Troughs	Sprink'g Cranes	Misce'- laneous	Total
1st and 12th...	1	778	484	4	6	5	76	2,613
10th and 11th..	6	950	2,023	83	9	8	46	7,971
3rd.....	5	599	1,252	153	2	3	295	6,334
2d, 4th and 5th	16	1,220	1,290	86	14	4	64	6,907
6th and 7th....	1	1,099	688	20	14	4	26	3,732
8th and 9th....	.....	541	443	4	5	3	81	2,053
Engine houses	20	12	35	.....	.....	.....	23	173
Parks .....	.....	24	.....	.....	.....	.....	.....	24
Cemeteries....	.....	10	.....	.....	.....	.....	.....	28
Grand total	49	5,233	6,215	350	50	27	611	29,834

During the past year there have been installed three hundred and twenty four meters for which the purchase price has been advanced by the water consumers to this department. These meters have been placed on services supplying apartment houses, double

tenement and residences equipped with modern plumbing. As shown elsewhere in this report there are still nearly two thousand services having hopper closets which are not metered, and I would recommend that where an inspection shows water being wasted, that the service be metered without delay.

All of the licensed plumbers have been notified that beginning April 1st, 1906 that hopper closet permits will not be granted unless a meter shall be installed on the service by the consumer.

HOUSE INSPECTIONS.

During the year just closed 2492 house inspections were made which have proved of value to the water department. It is contemplated that this work will be continued during the coming year, and that the entire City shall have been inspected before the closing of the fiscal year.

Respectfully submitted,

ADOLPH WURZBURG,

Chief Inspector.

REPORT OF CITY ENGINEER.

Grand Rapids, Mich., April 1, 1906.

MR. SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR:

Herewith is presented the Annual Report of the work done by the Engineering Department during the fiscal year ending March 31, 1906.

STREETS.

Profiles have been prepared and grade lines established upon streets and alleys to a total length of .824 miles during the year. .814 miles of streets have been added to the total mileage of 287.197 reported a year ago. 176.095 miles have been improved, leaving 111.916 or about 38 per cent of the total mileage still unimproved.

Grades have been re-established during the year on 0.983 miles of streets. The streets or alleys, extent and length of each upon which grades have been established or re-established, are given in the tables below:

GRADE LINES ESTABLISHED.

STREET.	EXTENT.	FEET.
Arlington street	Eight avenue, north	212
Calkins avenue	Wealthy Ave. to Kellogg & Calkins Add'n	430
Cass avenue alley	Wealthy avenue to Wenham avenue	517
Hurd court	Silas avenue to Carleton avenue	420
Hampton road	Robinson Ave. to north line East End Add'n	1,081
Van Dine court	East Fulton, north	632
York road	Robinson Ave. to north line East End Add'n	1,062
	4354 feet equals .824 mile.	

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**ASTOR, LENOX AND
TILDEN FOUNDATIONS**



WEALTHY AVENUE BRIDGE
Looking Eastward Across Grand River.

 RE-ESTABLISHED.

Clancy street	At Trowbridge street	400
Burton avenue	South Division street to Frances avenue	610
Horton avenue	Burton avenue, north	800
Market street, south	Wealthy avenue to Goodrich street	569
Maude avenue	Page to Spencer avenue	538
Wealthy avenue	Finney to Oakland avenue	1,051
Montgomery avenue	Jefferson avenue to Madison avenue	1,224
5192 feet or .983 mile.		

STREET IMPROVEMENTS.

Street improvement bonds to the amount of \$180.000 were issued during the year. The practice of the preceding year in ordering work early was continued with good results. Only a small amount of work ordered early was incomplete at the close of the season. Such delays as existed were caused largely by delays in securing water pipe.

No material change was made in the specifications for brick paving. In the past the expansion joints have been made with a coal tar filler, resulting in a very marked disintegration of the brick adjacent thereto. The past year an asphalt filler was used, with, as far as observed, improved results.

Two blocks of Kent street, where it was not desirable to close the street for the cement grout to set, were filled with an asphalt filler as an experiment.

Metropolitan Block was used exclusively except on Island street where Trimble was used. The practice of testing all brick before unloading from the cars has secured a better and more uniform quality of brick, and,

after the makers became familiar with our requirements, less annoyance and delay to the contractors.

A small section of the surface of the bitumious macadam on Lafayette street was covered with a soft flush coat of bitumen and stone chips rolled in. This having been a success, the Comon Council ordered the remainder of the steeper portion covered in a similiar manner. The season had so far advanced before the work was authorized, that it was impossible to secure a satisfactory union between the cold surface and the flush coat. The street has been in a safe condition during the winter, and more satisfactory results can be secured early in the season when the pavement is warm. The parties furnishing the bitumen have agreed to furnish new material without cost.

The work completed and the new work contracted for during the past year is shown in the following table:

WORK LEFT OVER FROM 1904. COMPLETED IN 1905.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	DIMENSIONS			COST		Amount paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll	
E. Bridge.....	At E. Dock Line.....	.....	121	.....	845	\$ 1566 00	\$ 1791 00	Kloote & VanderVeen
W. Bridge.....	At W. Dock Line.....	41	150	.....	276	505 00	670 00	Kloote & VanderVeen
Cherry St.....	S. East to Carroll Ave.....	42	1840	Old	9390	12100 00	16552 00	Kloote & VanderVeen
Court House and N. Ottawa Alleys	} Kent to Ottawa..... } Lyon to Court House Alley...	20	220	.....	} 483 } 660	2148 00	2470 00	Albert Prange
Bridge St. Bridge	.....	41	471	942	2303	7430 00	7730 00	Kloote & Vanderveen

ASPHALT BLOCK PAVEMENT.

No, Prospect.....	Fountain to Crescent.....	26	1258	2440	3254	\$ 9848 00	\$10163 00	J. McDermott & Son
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GRADED, GRAVELED AND GUTTERS PAVED.

†Aub'n A. (Alger)	Lake to Wealthy Aves.....	24	906	1706	\$ 1540 00	\$ 1700 00	D. W. Boyes
Calkins Ave.....	Lake Ave. to Buckeye.....	30	455	878	.....	1787 00	1952 00	F. M. Walworth
Earldom.....	Lake Ave to Cherry.....	28	355	712	.....	1595 00	1755 00	Kloote & VanderVeen
Fitzhugh.....	E. Fulton to Hermitage.....	30	585	1040	.....	2305 00	2500 00	Kloote & VanderVeen
Garden.....	Jefferson Ave. to So Division..	30	925	2006	.....	3949 00	4264 00	James Sherlock
Ionis, North.....	Fairbanks to Co'dbrook.....	30	2516	5006	.....	10973 00	11300 00	Albert Prange
Paris Ave.....	Adams to Oakdale.....	42	264	682	.....	2190 00	2600 00	Kloote & VanderVeen
Thompson Court.	Pleasant to Sycamore.....	16	471	904	.....	1449 00	1650 00	James Sherlock
Union, South.....	E. Fulton to Wealthy Ave	26	2576	5023	.....	8869 00	9250 00	James B. Hoey

WORK LET FROM MAY 1, 1905, TO APRIL 1, 1906.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	DIMENSIONS				COST		Amount paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of S.q. Yards	Contract Price	Amount of Roll		
Island	S. Division to So. Market St....	38 } 42 }	1440	Old	6120	\$ 9600 00	\$11100 00	.....	Jas. McDermott & Son
Kent	Crescent Ave. to Fairbanks St.	38 } 40 } 42 }	2221	.....	10120	18283 00	18850 00	.....	A. Prange
Oakes	S. Division to So Ionia.....	42	571	.....	2856	5678 00	5880 00	.....	A. Prange

NOT COMPLETED.

Wealthy Ave....	So. Ionia to Ellsworth	38 } 66 }	950	357	5000	\$10995 00	.....†.....	\$2597 00	Kloote & VanderVeen
Bridge, W	Stocking to Garfield Ave.....	38 } 42 }	3564	Old	16732	27519 00	.....†.....	.....	Chas. J. Carpenter
Canal	Leonard to Travis Ave.....	34	3286	5212	12671	25000 00	.....†.....	.....	Jas. McDermott & Son
Scribner	W. Bridge to Seventh.....	40	2586	Old	12015	22904 00	.....†.....	.....	Jas. McDermott & Son
Scribner.....	Seventh to Webster.....	40	4490	Old	20610	38957 00	.....†.....	.....	Jas. McDermott & Son

MACADAM (Re-surfacing)

Jefferson Ave....	Fifth Ave. to Hall.....	36	2576	Old	\$ 5828 00	\$ 67 20	\$4304 00	Jas. McDermott & Son
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CONCRETE (Uncompleted)

Cornwall Ave....	Pleasant to Fifth Ave.....	24	1003	2510	\$ 2858 00	\$ 3070 00	Kloote & VanderVeen
Lake Ave. & Auburn Av., Alleys .....	.....	16	471	33	868	1313 00	.....†.....	.....	Concrete Constr'n Co.

WORK LET FROM MAY 1, 1905, TO APRIL 1, 1906.—Continued.
GRADED, GRAVELED AND GUTTERS PAVED.

STREET	EXTENT	DIMENSIONS			COST		CONTRACTORS	
		Width of Road-way	Length of Street	Length of Curb	No. of Sq. Yards	Contract Price		Amount paid on Roll
Howard	Madison Ave. to So Union.	36	1250	3650	.....	\$ 6190 00	\$ 6515 00	Richard Pickett
West	W. Leonard to Crosby	36	1066	1268	.....	2666 00	2966 00	Jas. McDermott & Son
Ford	Brenner Ct. to Curtis	32	428	867	.....	1735 00	1915 00	Jas. Sherlock
"B"	Grandville to Sheridan	26	564	1076	.....	2111 00	2303 00	Gilner & Schneider
Sinclair	Bradford to G. T. Ry	24	1073	1978	.....	4944 00	5194 00	Jas. McDermott & Son
Emerald Ave	Harvey to Flat	36	1380	None	.....	5075 00	5370 00	Jas. McDermott & Son
Fuller, South	Lake Ave. to E Fulton	36	1453	3044	.....	6310 00	6636 00	Kloote & Vandervveen
Pribee	S. East St. to Winsor Ave.	36	1246	2964	.....	4875 00	5130 00	Kloote & Vandervveen
NOT COMPLETED.								
Adams	Madison Ave to S. East	36	2564	5376	.....	\$ 9740 00	\$10160 00	Fred Gilner
Bridge, W	Ditch to City Limits	.....	.....	.....	.....	18000 00	.....	John Hiseabutter
Canal	Travis Ave. to Dean	34	928	1971	.....	5000 00	.....	Jas. McDermott & Son
Carlson Ave	Lake to Wealthy Aves	36	750	1584	.....	3875 00	3885 00	Kloote & Vandervveen
Trowbridge	Clancy to N. Prospect	36	587	1158	.....	3650 00	.....	J. B. Hoey
Winter	Shawmut Ave. to Watson	36	1513	.....	.....	5349 00	.....	J. B. Hoey

* Paid by P. M. Ry. Co.

† Curb and Gutter Work.

‡ Contract price.

MILEAGE OF STREETS.

The mileage of streets in the City, and the length of each class of improvements are shown in the following table:

Graded and paved with sheet asphalt	5.833
“ “ “ “ block asphalt on gravel	1.215
“ “ “ “ “ “ “ concrete .....	.230
“ “ “ “ brick on concrete	13.030
“ and macadamized	6.272
“ “ paved with tar concrete .....	.341
“ “ “ “ cedar blocks on concrete	3.413
“ “ “ “ “ “ “ planks .....	.184
“ “ “ “ “ “ “ gravel .....	.628
“ “ “ “ Portland cement concrete .....	.704
“ “ “ “ cobble stones on gravel .....	.755
“ graveled and gutters paved with cobble stones	82.612
“ “ “ “ “ “ “ brick	30.797
“ and graveled	30.081
Unimproved	111.916
<hr/>	
Total	288.011

ROAD ROLLERS.

Rolling with the steam roller began April 1st, 1905 and work was suspended December 8th, 1905.

The two smaller rollers were busy during the entire season, the amount of paving and trench work being more than the No. 4 could properly care for. The No. 2 being lighter was used on trenches and streets having a subgrade too soft to bear the heavier rollers.

Early in the season it seemed probable that another roller would be needed. An opportunity being offered to secure a new Oastler ten ton roller for \$1,800, it was accepted. The roller was not used regularly but was convenient for emergencies.

The No. 2 Kelly roller had been in service two years. It was the first of this design made by the Company, and was turned out on a rush order under unfavorable conditions. The Company were not satisfied with its operation in all respects, and of their own volition offered to send a new and improved machine of the same design, conditioned, on the City's paying freight both ways. This generous offer was accepted and our repair shop saved considerable work on repairs. The other rollers have undergone very thorough repairs, new gears and parts secured, where necessary, and the machines put in the best possible condition for the season's work.

The maintenance and operation during the past year are itemized as follows:

ROLLERS—Expense for Fiscal Year 1905-06.

No. 1 KELLY ROLLER.

Maintenance —	Wages.....	\$ 193 47
	Parts and miscellaneous.....	258 45
Operation —	Wages.....	716 85
	Coal and kindling.....	291 02
	Supplies.....	82 26
	Total.....	\$1,492 05

No. 2 KELLEY ROLLER.

Maintenance —	Wages.....	\$ 30 45
	Parts and miscellaneous.....	30 26
Operation —	Wages.....	757 76
	Coal and kindling.....	270 87
	Supplies.....	20 96
	Total.....	\$1,110 30

FO. 3 RUSSELL ROLLER.

Maintenance —	Wages.....	\$ 93 96
	Parts and miscellaneous.....	49 16
Operation —	Wages.....	715 63
	Coal and kindling.....	258 12
	Supplies.....	30 30
	Total.....	\$1,147 17

NO. 4 ROLLER.

Maintenance —	Wages	\$ 56 51
	Parts and miscellaneous.....	94 48
Operation —	Wages.....	742 28
	Coal and kindling.....	201 00
	Supplies.....	19 29
	Total.....	\$1,113 56

NO. 5 ROLLER.

Maintenance —	Wages	\$ 1 22
	Parts and miscellaneous.....	27 92
Operation —	Wages.....	50 66
	Coal and kindling	23 14
	Supplies.....	55 65
		\$ 158 59
Cost of new No. 5 roller (besides exchange of old roller).....		1,799 50
Freight on new No. 5 roller.....		60 00
Coal wagon for No. 5 roller.....		68 00
		\$1,927 50
Cost of maintaining roller shed.....		\$ 18 38

SEWERS.

Excepting the west side ditch sewer, the sewer work of the year consisted chiefly in the construction of small tile sewers.

The west side ditch sewer was contracted for in August, 1905. It was expected that a very material progress would be made in the work before winter. Up

to the present the progress made has been anything but encouraging.

The table on the opposite page gives the sewers constructed or contracted for during the fiscal year.

The above noted sewer work cost \$127,835.00.

The work of the season increases the sewer system 5.213 miles.

The length of the sewers of the city are as follows:

Combined.....	126.596
Separate system }	Sanitary..... 12.726
	Storm 11.619

Composed of the following:

Brick	23.083
Vitrified pipe.....	122.013
Cement pipe .....	.100
Wrought iron pipe.....	.160
Cast iron pipe.....	.224
Concrete sewer.....	4.967
Concrete-brick.....	.894
Total.....	150.941

In connection with this system there are 2,580 man-holes.

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING MARCH 31, 1906.

The table following gives the location, kind and cost of sewers constructed during the year.

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTORS		
		INCHES		LENGTH		Contract Price	Amount of Roll			
		Vitrified Pipe	St. Clay						Sanitary and Combined	
East St. N.	East Fulton to Fountain	{	8	...	170	3	{ \$1140 00	\$1306 00	Rens & VanEss.	
Atwood	Extention to N. East		9	...	560	1				
Lockwood	N. East, 150' west		9	...	120	1				
			8	...	150					
Crosby	Broadway to Quarry	{	9	...	443	4	{	1098 00	Done by the City.	
Broadway Alley	Crosby to Myrtle		8	...	463	2				
Elighth Avenue	S. Division to Central Ave.	{	9	...	316	2	{ 648 00	793 00	Peter Dewit.	
Arlington	Elighth Ave., north		9	...	200	1				
		{	12	...	153	...	{ 3896 00	4213 00	John Hlaeshutter.	
			15	...	369	...				
			18	...	576	9				
			20	...	266	...				
			24	...	198	...				
			30	...	200	...				
Bridge St. W.	Garfield to Littlefield Aves.	{	9	...	183	1	{	465 00	Harrison & Hilding.	
			9	...	279	...				
			12	...	876	7				{ 3300 00
			15	...	692	...				
Howard	S. Union to Madison Ave.	{	9	...	983	5	{ 1397 00	1557 00	Jabob Heerschap.	
			12	...	350	...				
Colt Ave. N.	Colfax to Sweet	{	9	...	342	2	{ 521 00	620 00	Peter DeWit.	
			9	...	230	1				{ 265 00
Logan.	S. Union to James		9	...	684	3					{ 864 00
Second	Michigan to Fremont		9	...		2				{ 1224 00
Division St. N.	Monroe to Park		...	225	2				Kloote & VanderVoen.	

SEWERS CONSTRUCTED -- Continued,

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTORS
		INCHES		LENGTH		Contract Price	Amount of Roll	
		Vitrified Pipe.	Concrete						Sanitary and Combined
Cornwall Ave.....	Fifth Ave. to Pleasant.....	9	....	770	.....	\$ 749 00	\$ 880 00	Jacob Heerschap.
Carleton Ave.....	Lake to Wealthy Aves.....	8	....	800	3	921 00	1091 00	Rens & VanEss.
West	Crosby to Courtney.....	9	....	240	1	379 00	479 00	Rens & VanEss.
Prince.....	Kalamazoo to Winsor Ave.....	{ 9 12	.... ....	277 275	..... 2	{ 574 00	680 00	Peter DeWit.
King	Grandville Ave , west.....	9	....	708	4	986 00	1130 00	Joseph Owens.
Vandine Court.....	East Fulton, north	9	....	654	3	950 00	1100 00	Meyer & Heerschap.
+ Pearl.....	North Ionia, west.....	15	....	200	1	{	1310 00	Done by the City.
Ionia N.....	Pearl, south.....		127	1				
Lyon	Grand Ave. to N. East.....	8	....	667	4	{ 1144 00	.....	Meyer & Heerschap.
Grand Ave.....	Parkwood Ave. to Lyon.....	8	....	157	1			
West Side Ditch.....	N. St. to Grand River.....	{	96 to 30	..... 16774 .....	..... 39	{ 104000 00	.....	Nation'l Construc'n Co.

* Concrete reconstruction. † Brick reconstruction.

WATER WORKS.

The work contemplated under the Water Works Extension bond issue of \$170,000 has been nearly completed, excepting the construction of the standpipe. Most of the smaller mains were laid by contract. Prices received on the larger sizes seemed so high that the work was done by day labor. The latter plan is the more satisfactory, better work being secured at less expense, especially when the conditions to be met are at all uncertain.

The pipe, specials, valves, and hydrants were purchased the previous season as far as the demands could be anticipated. It was fortunate that such was the case, as difficulty was experienced in securing pipe and specials promptly. Several improvements were seriously delayed from this cause and the price was very materially higher.

Plans and specifications for a reinforced concrete elevated tank with casing tower were prepared and bids received. On account of the amount of the bids and local contractors not being prepared to guarantee their work, the reinforced tank was abandoned and plans are nearly completed for a steel tank on a reinforced concrete foundation. The necessary additional money for the casing tower was voted at the spring election. The mains that will permit of the southeast portion of the city being put on the high service have been laid, and are ready for use when the standpipe is in service.

Following are tables giving the mains laid and lowered during the year. Those laid by day labor or paid for from the Water Works Fund are properly designated. In connection with the lowering of mains some

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.



NORTH LAFAYETTE STREET

Bituminous Macadam Pavement. Looking North Near Fulton Street.

expense was incurred that should be charged to construction. Such amounts are shown in table. A table is also given showing corrected costs of work but partially executed the preceeding year, and tabulated in the last report.

WATER MAINS.

STREET	EXTENT	Distance in feet from E + W + N + S Street Line	DIAMETER IN INCHES						COST	
			6	8	10	12	16	20	Material	Labor
* B	Grandville to Sheridan Aves.,	24	578	.....	.....	.....	.....	.....	226 41	211 31
* Bridge W	Sunset Ave to J B P. Boul'd.,	25	.....	405	.....	.....	.....	.....	539 01	94 54
Carlton Ave	Lake to Wealthy Aves.,	25	.....	772	.....	.....	.....	.....	737 18	534 30
* Chester	S. Diamond to Carroll Ave.,	25	355	.....	.....	.....	.....	.....	127 35	133 58
* Cornwall Ave.,	Fifth Ave. to Pleasant.,	8	1050	.....	.....	.....	.....	.....	671 71	455 54
Dickinson Ave	Madison to College Aves.,	25	640	.....	.....	.....	.....	.....	393 33	227 73
* Emerald Ave.,	Harvey to Flat.,	25	1271	.....	.....	.....	.....	.....	508 55	500 34
* Ford	Curtis to Brenner Court.,	11	468	.....	.....	.....	.....	.....	307 23	254 60
* Fuller S.	E. Fulton to Hope Ave.,	25	.....	.....	971	.....	.....	.....	582 43	533 41
† Fulton E.	Fuller to Carlson Ave	21	.....	.....	977	.....	.....	.....	994 67	631 59
† Grand Ave.,	Innes Ave. to E. Bridge	25	731	.....	.....	.....	.....	.....	379 02	364 20
† Hall	S. Division to Terrace Ave.	23	20	.....	.....	1876	.....	.....	1600 14	1300 21
* Harvey.	N East to Emerald Ave.,	30	340	.....	.....	.....	.....	.....	118 63	126 54
* Howard	Madison Ave. to S. Union	25	1318	.....	.....	.....	.....	.....	630 97	528 04
* Island	S. Division to S. Market.	26	104	.....	1302	.....	.....	.....	1833 61	1349 70
† Kalamazoo Ave.,	Hall to Powers.	35	.....	.....	.....	1765	.....	.....	622 00	261 34
* Kalamazoo Ave	Powers to Oakdale Ave	25	.....	.....	.....	.....	.....	.....	1710 69	764 31
† Lock and Huron	.....	15	.....	.....	511	.....	.....	.....	737 31	709 48

WATER MAINS—Continued.

STREET	EXTENT	Distance in feet from Street Line				DIAMETER IN INCHES						COST		
		E	W	N	S	6	8	10	12	16	20	Material	Labor	Total
Louis	N. Market to N. Ionia.....	34				.....	.....	.....	658	.....	.....	1177 98	1313 10	2490 99
+ Mill	Huron to Bridge	8				.....	.....	483	.....	.....	.....	1040 36	651 16	1700 54
+ North ..	Davis to Quarry	25				.....	.....	.....	.....	828	.....	1147 41	881 02	3028 43
* Oakes, ..	S. Ionia to S. Division ..	25				.....	.....	583	.....	.....	.....	752 34	755 41	1507 75
+ Ottawa, N. .	Monroe to Louis	27				.....	.....	.....	.....	.....	312	1061 42	1083 91	2154 33
+ Pleasant Ave.	Orchard Place to N. Union.	20				176	.....	.....	.....	.....	.....	124 26	112 82	237 08
* Paris ..	Adams to Oakdale Ave....	20				328	.....	.....	.....	.....	.....	185 88	147 14	333 42
Prince ..	S. East to Winsor Ave....	25				1285	.....	.....	.....	.....	.....	573 61	467 36	1040 97
+ Ridge Ave ..	S. Division to Buchanan....	26				1274	.....	.....	.....	.....	.....	794 57	645 23	1439 80
+ River Crossing. .	At Coldbrook .....	.....				.....	.....	.....	.....	.....	.....	2135 90	287 25	2423 15
+ Vander Veen Court	S. East, west, .....	.....				261	.....	.....	.....	.....	.....	153 00	59 87	192 87
+ Valley Ave	Jackson, north,	25				159	.....	.....	.....	.....	.....	96 30	23 69	119 99
4.2 miles of pipe laid.												22287 37	15637 33	37924 70
Total...														

CONSTRUCTION INCIDENT TO LOWERING, PAVING, ETC.

MAIN.	PLAN TITLE	SIZE OF PIPE					COST OF PIPE		Cost of specials valves & hydrants		TOTAL COST
		4	6	8	10	12	Material	Labor	Material	Labor	
*S. East	Cherry and Lake ..					64	818 05	\$31 30	\$226 78	\$127 61	\$418 64
*Eight Ave	Jefferson Ave		51				34 98	35 14	51 57	33 18	153 81
*Highland Ave ..	Jefferson Ave		54								
*College Ave	Leonard, Carrier & College								49 13	7 53	57 06
*Carrier									7 00		7 00
*Fountain to Cres't	N. Prospect								71 73	81 21	153 94
*S. Ionia	Wealthy and Ionia ..				29		30 56	30 56	56 40	38 56	159 37

WATER MAINS LOWERED.

	E	W	N	S	6	8	10	12		
* Cherry Lake Av			23		157	1073			\$8055 05	\$2055 05
* Jefferson Ave ..			25		253	253			1500 31	1000 31
† Leonard, E		25			2507				95 94	95 94
* N. College Ave ..		25			1449				230 23	230 23
* Carrier		25			663				290 34	290 34
* Prospect N		25			648				113 94	113 94
* Ransom (4 in.) ...		25			1204				107 08	107 08
* Sinclair (4 in.) ...		25			520					
* Wealthy Ave.		30			194					

† Day labor. * Mains paid for by Water Works Fund. ‡ Partial cost. 1.413 miles of pipe lowered.

Grand total, (Total Material) \$43068 65

The Table Following Gives Corrected Cost Items of Mains in Streets
Shown in the Last Annual Report.

		Material	Labor	Total
Alger Ave....	Lake-Wealthy.....	\$ 503 62	\$ 376 38	\$ 880 00
Bates St.....	Fuller-West	520 45	353 45	873 90
Briggs Place.	Ames-Quimby.....	79 18	19 08	98 26
Cole St	Sweet-Marietta.....	419 33	212 60	631 93
N. East St....	E. Bridge-Flat.....	1,856 51	956 54	2,813 05
S. East St....	Hall-Crofton Av.....	3,199 04	1,527 32	4,726 36
Ellsworth Av.	{ Cherry-Island	338 33	369 03	707 36
	{ also Bartlett-Wealthy.			
Ellsworth Av.	Cherry Bartlett.....	871 63	1,062 90	1,934 53
Evergreen Av.	S. East-West	78 19	65 19	143 38
N. Forrest St.	Quimby-Sweet	393 19	419 18	812 37
N. Front St..	Myrtle-So. of Leonard..	3,866 37	2,153 04	6,019 41
S. Fuller St..	Sherman-Fifth.	2,379 02	1,028 54	3,407 56
Griggs Av....	S. Division-Jefferson...	950 61	761 92	1,712 53
High St.....	Grandville-East.....	404 24	219 98	624 22
Horton Ave..	Griggs Ave.-South.....	112 52	199 71	312 23
Hovey St.....	Marion-Gunnison.....	745 18	443 38	1,188 56
Kent St	Lyon-Newberry	13,014 50	7,110 68	20,125 27
Lyon St.....	Kent-Ottawa	1,208 84	142 21	1,351 05
Lockwood St.	East-West	118 59	116 19	234 78
Marion St....	Park Ave. W. Fulton...	1,051 25	618 07	1,669 32
North St.	Scribner-Broadway.....	2,072 94	597 81	2,670 75
Pleasant St...	Morris-S. College.....	304 22	25 98	330 20
Quimby St...	N. Lafayette-North Av..	378 51	381 80	760 31
Rennselaer St.	White-West	196 35	169 96	366 31
Scribner St...	Webster-North	1,281 81	696 21	1,978 02
Sigsbee St....	Diamond-Fuller	1,511 53	1,138 59	2,650 12
Sibley St....	Marion-West.....	54 61	112 34	166 95
Sweet St.....	Plainfield-N. College Av.	1,058 50	725 28	1,783 78
Thomas St...	S. Fuller-West.....	323 68	318 37	642 05
S. Union St..	Worden-Hall	4,113 18	1,917 03	6,030 21
Waters Place.	At Plainfield Av.....	78 86	161 63	240 49

STATEMENT OF WATER WORKS EXTENSION FUND FOR FISCAL YEAR ENDING MARCH 31, 1906.

RECEIPTS.

Balance on hand April 15, 1905	\$30,369 63
Sale of material	14,813 30
Transfers	720 54
	<hr/>
Receipts	\$45,903 47
Disbursements	25,503 52
	<hr/>
Balance on hand April 1, 1906	\$20,399 95
Assets;-Material furnished W. Wks.....	\$4,348 44
Accounts receivable	84 73
	<hr/>
	\$4,433 17

DISBURSEMENTS.

Standpipe	\$ 185 35
Material-Contract	10,016 54
Material-Cartage	337 48
Material-Inspection	67 13
Material-Miscellaneous	1,284 30
Laying-Labor	7,768 84
Laying-Contract	2,388 78
Laying-Inspection	151 88
Laying-Engineering and Rolling	1,252 00
Laying-Miscellaneous	2,051 22
	<hr/>
	\$25,503 52

The total miles of pipe in the Water Works System prior to May 1, 1905, the amount laid between May 1, 1905, and April 1, 1906, the amount removed during the same time and the total April 1, 1906, are given in the following table:

MILES.

	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	24 in.	30 in.	36 in.	Hy- drants	Valves
Prior to 1905.....	40.548	59.687	20.904	7.165	15.342	.239	8.297	.749	1.959	1.927	.585	.019	1481	1455
Laid in 1905.....	.....	1.951	.161	1.054	.816	.....	.155	.....	.059	.....	.....	.....	52	105
Totals.....	40.548	61.638	21.065	8.219	16.158	.239	8.452	.749	2.018	1.927	.585	.019	1533	1560
Removed.....	.102	.....	.063	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	40.446	61.638	21.002	8.219	16.158	.239	8.452	.749	2.018	1.927	.585	.019	1533	1560

WATER WORKS INVENTORY.

As per your request, an inventory giving the structural value of the City Water Works, not including meters, which has been carefully considered.

The yearly financial statement of the Water Department under the new system of accounts will very properly require an annual inventory. To yearly make a detailed inventory of all mains, including valves and hydrants, pumps, boilers, buildings, reservoirs and standpipes, based on the current prices of labor and material involves so much labor as to be practically prohibitive. Considerable study was therefore given the subject in hopes of evolving some method that would give due consideration to the character of structure, its probable life and present condition, and yet permit of the annual changes in value being determined with the minimum amount of labor.

Unquestionably the most accurate present values would be based on an annual inventory giving cost of replacing the plant at current prices, assuming as near as may be, the life of each class of structure, and knowing its age, apply the sinking fund principle, at a low rate of interest to determine its depreciation and present value. This, as stated above, involves yearly a large amount of labor.

It seemed that a similar method might be evolved based on the original cost of construction, provided current prices do not vary too widely from the average original prices. With this in view, the original construction prices and totals were examined. This shows

about 75 per cent of the cost of construction has been in mains. During the first two years, 1873 and 1874, wooden pipe was largely used. This was later entirely replaced with cast iron. The following table shows the prices paid for cast iron pipe when any material amount was laid:

1876.....	\$.....	\$33 00	\$.....
1880.....	.....	32 00	.....
1881.....	.....	32 60	.....
1882.....	.....	32 60	.....
1883.....	.....	39 00	.....
1884.....	.....	35 00	.....
1885.....	26 50	to	35 00
1886.....	27 60	to	32 00
1888.....	24 35	to	24 95
1889.....	.....	24 75	.....
1890.....	22 98	to	23 98
1891.....	22 48	to	23 98
1892.....	.....	25 25	.....
1893.....	24 40	to	25 00
1895.....	18 90	to	21 40
1896.....	.....	19 00	.....
1897.....	.....	15 47	.....
1898.....	.....	15 92	.....
1899.....	.....	17 40	.....
1900.....	.....	17 40	.....
1901.....	.....	22 40	.....
1902.....	.....	22 40	.....
1903.....	29 90	to	30 40
1904.....	.....	22 70	.....
1905.....	.....	22 70	.....
		<hr/>	
		\$626 70	\$646 30
		<hr/>	
Average.....	\$ 25 07		\$ 25 85

The average for the entire period is but little above the average for the past five years.

The cost of laying has varied with the conditions of the labor supply, the character of the ground and the

nature of the street improvement that must be replaced. The cost of laying the mains to-day with modern pavements to replace would be largely in excess of original costs.

All conditions considered, the cost of replacing the mains to-day would not vary materially from the average of the original cost.

As concerns the remaining 25 per cent of the structures, the life of the pumps and boilers is comparatively short and the extreme variation in costs during such period is not great. The reservoir and standpipe of the same quality of material and workmanship could be replaced at about original cost. The quality of material and capacity of structure would be somewhat increased if built to-day. The pumping station could not be rebuilt for original cost, but on the other hand it is not adequate in size, is unsatisfactory in arrangement and in portions defective in construction.

The above facts indicate that the average cost of construction during a period of five to ten years will not materially vary from the cost of construction during the life of the various structures composing a water works plant. The average cost during short periods forming cycles of cost variations would seem to be as close a refinement as should be attempted.

To consider annual variations would but add confusion and uncertainty in arriving at the actual economical results secured in the operation.

The next step involved a careful detail study of the original costs of construction as given in the annual statements since the building of the plant. Detail inventory sheets were prepared on which was entered

from old plans, estimates, and the book of accounts, the original cost during each year of each main, with valves and hydrants, pumps, boilers, pumping station, reservoir, standpipe, intakes, etc. As the works were improved, mains or other structures were abandoned or replaced with others, the original cost of such portions of the work were entered in a column headed "Removed or Abandoned" with the date. The item cost of material and labor for each year is also entered for future reference. The records now show the cost of original construction, the amount abandoned and remaining cost for all parts of the work for each year. Having the total remaining original cost for each year for each character of structure, there remains only the application of the sinking fund principle to determine the actual value at any time.

The common method of determining the depreciation on municipally owned public utilities has been the so-called straight line formula. By this method the life of the structure or more commonly the entire plant is assumed and the proper percentage deducted each year of use. This does not seem a logical method, as the depreciation on most structures and machines is little if any during the first few years of use, but gradually increases until during its later years its efficiency and usefulness rapidly decreases. Many times it is used for reserve only.

The sinking fund method provides for the setting aside of such a sum annually at a low rate of interest and compounded that the funds will be provided to replace the structure on the expiration of its assumed life. This gives a much lower rate of depreciation during the

earlier years when the structure is new and the efficiency high, with a gradually increasing depreciation with increased age. It is evident that low rates of interest only can be expected, ranging from 2 to 3½ per cent.

The life of the various structures with the per cent of interest reasonably expected on the investment has been assumed as shown below in determining the depreciation.

STRUCTURE	Life	Per cent
Mains	100	2½
Buildings	50	3
Reservoir.....	50	3
Pumps and boilers.....	30	3½
Standpipe (iron).....	30	3½
Intake.....	30	3½

The following tables give the original cost, structures and land, removed or abandoned, depreciation, and remaining or present value.

The following formula has been used in computing the value of \$1 laid aside yearly and compounded:

$$S \text{ equals } \frac{(1 \text{ plus } r)^n \text{ minus } (1 \text{ plus } r)}{r}$$

- In which
- S* equals value at end of *N* years.
- n* equals life of structure.
- n'* equals age of structure (considered as life in determining *s'*.)
- r* equals rate of interest.

INVENTORY ON MAINS.

1	2	3	4	5	6	7	8	9	10	11	12
Year	Original cost	COOST Removed	Remaining cost	\$	Life in years	Cost of replac- ing by new	Yearly deposit or amount put by each year (4)-(7)	Age in years	\$ for \$ 1.00 compound'd in years	Total depreciation (8)x(10)	Remaining value (4)-(11)
1873	\$ 38001 07	\$ 380 80	\$ 38040 18	\$ 3 74	100	\$ 443 87	73 61	33	49 33	\$ 3630 45	\$ 38009 73
1874	110873 09	67557 80	25316 09	"	"	"	83 58	31	47 15	2479 15	30389 94
1875	42586 96	24196 33	18383 76	"	"	"	41 35	30	45 00	1880 75	15473 01
1876	25453 53	.....	25453 53	"	"	"	57 48	29	43 90	2463 32	23395 51
1877	.....	.....	.....	"	"	"	.....	.....	.....	.....	.....
1878	.....	.....	.....	"	"	"	.....	.....	.....	.....	.....
1879	58 50	.....	58 50	"	"	"	13	26	38 91	4 43	49 07
1880	7263 23	7263 23	.....	"	"	"	.....	.....	.....	.....	.....
1881	27294 54	2435 76	24868 78	"	"	"	56 09	34	38 15	1859 38	28009 40
1883	519 77	.....	519 77	"	"	"	1 17	23	31 35	30 08	483 09
1883	10014 87	.....	10014 87	"	"	"	23 58	22	39 56	667 92	9346 95
1884	3023 96	384 55	3399 43	"	"	"	7 31	21	27 86	503 06	3053 77
1885	15878 77	968 01	17210 16	"	"	"	39 04	30	36 18	1029 07	16288 09
1886	16133 84	395 77	15768 07	"	"	"	35 56	19	24 54	872 64	14995 43
1887	29453 76	.....	29453 76	"	"	"	66 43	18	23 95	1524 57	27928 19
1888	121113 38	4317 61	117795 72	"	"	"	395 08	17	21 39	5683 90	112113 82
1889	110601 02	1127 00	115474 02	"	"	"	290 45	16	19 86	5172 53	110302 09
1890	10816 70	877 33	9739 37	"	"	"	21 97	15	13 38	408 80	9835 37
1891	104440 58	686 55	103764 03	"	"	"	224 08	14	16 93	3383 97	94881 06

INVENTORY OF MAINS—CONTINUED.

1	2	3	4	5	6	7	8	9	10	11	12
Year	Original cost	Removed	Remaining cost	%	Life	Compounded	Yearly deposit or amount put by each year (\$1)-(7)	Age	\$' for \$1.00 compounded n' years	Total depreciation (\$1)-(10)	Remaining value (\$1)-(11)
1903	\$ 78444.50	\$ 491.88	\$ 77952.62	2 1/2	100	\$ 443.27	175.88	13	15.58	\$ 2788.78	\$ 75663.80
1903	43557.54	1298.47	42459.07	"	"	"	95.31	12	14.14	1347.68	40811.39
1904	32677.97	.....	32677.97	"	"	"	60.65	11	13.60	891.58	31886.45
1905	19230.10	213.07	19016.03	"	"	"	48.87	10	11.45	408.15	18617.88
1906	53523.76	.....	53523.76	"	"	"	130.78	9	10.30	1221.34	52302.42
1907	25533.05	.....	25533.05	"	"	"	50.92	8	8.96	455.25	25077.80
1908	32490.39	.....	32490.39	"	"	"	73.30	7	7.74	567.34	31923.05
1909	38590.43	346.15	38244.28	"	"	"	63.23	6	6.56	414.76	37829.52
1910	10270.04	.....	10270.04	"	"	"	23.16	5	5.29	194.83	10075.21
1911	7845.01	168.26	7676.75	"	"	"	17.53	4	4.36	74.66	7592.05
1912	3400.07	214.22	3185.85	"	"	"	18.46	3	3.15	56.15	3123.90
1913	43620.96	.....	43620.96	"	"	"	90.13	2	2.03	189.92	43431.04
1914	99261.52	.....	99261.52	"	"	"	223.89	1	1.02	223.87	99037.65
1915	40826.25	.....	40826.25	"	"	"	92.08	0	0	0	40826.25
	\$ 119782.53	\$ 34.21	\$ 119816.74	.....	.....	.....	.....	.....	.....	\$ 40928.04	\$ 78888.70

Check (4) equals (11) plus (12)
 1,055,061.31 equals 40928.04
 998093.27
 \$ 1,055,061.31

INVENTORY OF PUMPING STATION.

(1) YEAR	(2) (3) (4) (5)					(6) Per cent r	(7) Life n	(8) S for \$1 com- pounded for n years	(9) Yearly deposit (5) ÷ (8)	(10) Age n'	(11) S' for \$1 com- pounded n' years	(12) Total depreca- tion (9) x (11)	(13) Remain- ing Value
	ORIGINAL COST		COST										
	Land	Structural	Removed	Remaining cost									
1874	\$5000 00			\$ 5000 00									\$5000 00
1874		\$23493 70		23331 31	3	59	\$116 18	\$ 191 35	31		\$61 50	\$9854 53	12376 78
1875		1839 11		1819 11			"	15 65	30		49 00	768 85	1058 26
1876		1164 58		1164 58			"	10 08	29		46 57	467 10	697 48
1877		70 95		70 95			"	61	28		44 23	26 97	43 98
1878		83 50		83 50			"	71	27		41 93	39 77	58 78
1879		497 44		497 44			"	4 28	26		39 71	109 98	237 48
1880		39 79		39 79			"	34	26		37 55	13 77	37 08
1881		21 12		21 12			"	18	24		35 46	6 38	14 74
1885		136 25		136 25			"	1 17	29		37 68	33 39	108 89
1888		2907 62		2907 62			"	25 02	17		23 41	560 69	2346 98
1889		516 89		516 89			"	4 44	16		20 76	98 17	424 73
1890		93 05		93 05			"	80	15		19 16	15 33	77 79
1891		5292 24		5292 24			"	45 55	14		17 00	891 68	4490 56
1892		16586 19		16586 19			"	142 76	13		16 09	2297 01	14289 18
1893		10738 52		10738 52			"	92 43	12		14 68	1261 23	9887 20
1894		489 75		489 75			"	4 23	11		18 19	55 66	434 09
1895		568 99		568 99			"	4 90	10		11 81	57 87	511 13
1897		1173 76		1173 76			"	10 10	8		9 16	92 53	1081 24
1899		16 46		16 46			"	14	6		6 66	26	15 53
1900		357 05		357 05			"	3 07	5		5 47	16 79	340 26
1905		133 30		133 30			"	1 14					133 30
	\$5000 00	\$65318 26		\$60936 87								\$16703 69	\$65328 18

Total equals \$70218 26.

INVENTORY OF MACHINERY.

(1) Year	(2) Original cost	(3) Cost removed	(4) Re- maining cost	(5) %	(6) Life n	(7) \$ for \$1 com- pounded n years	(8) Yearly deposit (4) ÷ (7)	(9) Age n	(10) \$ for \$1 compounded n years	(11) Total de- preciation (8) x (10)	(12) Re- maining values (4) — (11)
1874	\$22929 34	\$3791 52	\$19137 82	3½	30	\$53 43	\$358 18	31	Over 30 yrs. total depre. = Cons.	\$19137 82	.....
1875	3943 52	.....	3943 52	.....	.....	"	73 81	30	53 43	3943 52	.....
1877	3368 66	3368 66	.....	.....	.....	"	.....	.....	.....	.....	.....
1878	10505 10	.....	10505 10	.....	.....	"	196 61	27	45 29	8904 47	\$1600 63
1879	1086 45	.....	1086 45	.....	.....	"	20 33	26	42 76	869 31	217 14
1886	381 00	300 00	81 00	.....	.....	"	1 52	19	27 28	41 46	39 54
1887	176 60	130 10	46 50	.....	.....	"	87	18	25 36	22 06	24 44
1888	15240 05	7941 06	7296 99	.....	.....	"	136 60	17	23 50	3210 10	4068 89
1889	15587 58	13833 11	1754 47	.....	.....	"	32 84	16	21 70	712 63	1041 84
1890	3613 76	2069 54	1544 22	.....	.....	"	28 90	15	19 97	577 13	967 09
1891	32587 12	.....	32587 12	.....	.....	"	609 90	14	18 30	11161 17	31425 95
1892	33175 70	.....	33175 70	.....	.....	"	630 92	13	16 68	10356 95	22818 75
1893	2152 71	.....	2152 71	.....	.....	"	40 29	12	15 11	608 78	1543 98
1894	4266 25	.....	4266 25	.....	.....	"	79 85	11	13 60	1085 96	3180 29
1895	39561 09	.....	39561 09	.....	.....	"	740 43	10	12 14	8988 83	30572 27
1896	4707 50	.....	4707 50	.....	.....	"	88 11	9	10 73	945 42	3763 08
1897	907 81	.....	907 81	.....	.....	"	16 99	8	9 37	159 20	748 61
1900	263 60	.....	263 60	.....	.....	"	4 92	5	5 55	27 31	236 29
1901	1500 00	.....	1500 00	.....	.....	"	28 08	4	4 36	122 43	1377 57
1902	3500 00	.....	3500 00	.....	.....	"	65 51	3	3 23	210 94	3289 06
1903	1257 61.. shop	.....	1257 61	.....	.....	"	23 53	2	2 11	49 65	1207 96
1903	3616 60.. station	.....	3616 00	.....	.....	"	67 67	2	2 11	142 73	3473 23
1904	143 25	.....	143 25	.....	.....	"	2 68	1	1 03	2 76	140 49
1905	2649 31	.....	2649 31	.....	.....	"	49 58	0	.....	.....	2649 31
.....	\$207120 01	\$31433 99	\$175686 02	.....	.....	.....	.....	.....	.....	\$71280 67	\$104405 35

INVENTORY OF RESERVOIRS.

(1) Year	(2)	(3)		(4) COST		(5)	(6) %	(7) Life in years	(8) Years elapsed for com- pound- ing	(9) Yearly depos- its (5) — (8)	(10) Age in years	(11) S' for \$1.00 compound- ed for n years	(12) Total depreciation (9)x(11)	(13) Remaining value (5)-(12)
		ORIGINAL COST		Removed	Remaining cost									
		Land	Structural											
1874	\$25000 00				\$ 25000 00									\$ 25000 00
1874			\$ 33654 71		33654 71	3	50	\$ 116 18		\$ 304 86	31	\$ 51 50	\$ 96000 36	32654 43
1875			24508 50	\$ 24508 50										
1876			4006 06	4006 06										
1877			124 04	124 04										
1901			45 00		45 00					30	4	4 31	1 08	43 32
1902			680 85		680 85					7 58	11	2 09	15 84	865 01
	\$25000 00		33654 71		68654 71									
Total —			\$ 113530 06	\$ 24508 50	\$ 89021 56								\$ 36017 81	\$ 52912 75

INVENTORY OF INTAKES.

1897	\$ 4084 26	\$ 4394 33																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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PUBLIC LIBRARY

ASTOR LENOX AND
TILDEN FOUNDATIONS



QUIGLEY AVENUE

Portland Cement Concrete Pavement. With Park Along Center.
Looking West from Division Street

CONDUITS FOR CITY WIRES.

Over \$35,000 was asked of the Common Council for construction of conduits and placing of city wires in the Conduit District underground. An appropriation of \$8,000 was allowed for commencing the work.

The conduits in Oak street and across Kent street were laid in advance of the improvement.

Those in North Division street were laid in common with the Grand Rapids Edison Company. Park and Pearl street's conduits connect with the Division street line. The cost of the Division street line includes the Edison Company's portion, bill for which has not been rendered as the work is not completed.

The following gives receipts and expenditures for the conduit fund :

STATEMENT OF CONDUIT FUND MARCH 31, 1906.

Amount allowed in budget.....	\$8,000 00	
Receipts—Sale of material from N. Division St.....	11 16	
Money expended—		
Oak St. conduits — Ionia to Division.....	\$1,003 58	
N. Division St. conduits — Park to Crescent.....	8,218 72	
Park St. conduits — Division to W. Park.....	168 57	
Pearl St. conduits — Division to Ionia.....	237 58	
Cables for Bridge St. Bridge.....	721 80	
Pipe for conduits at Hastings St. crossing Kent St.	15 80	
Bridge St. bridge conduits.....	1 05	
	<u>\$5,361 60</u>	<u>\$8,011 16</u>
		5,361 60
Balance.....		<u>\$2,649 56</u>

BRIDGES.

Bridge repair work consisted chiefly in reinforcing girders and replanking Leonard Street bridge and repairing the planking on Sixth and Fulton St. bridges.

A statement of the expense incurred follows :

LEONARD STREET BRIDGE.

Labor.....	\$ 915 90
Material.....	2,516 50
Engineering.....	55 00
Cartage and freight	26 36
Tools.....	13 32
Miscellaneous.....	20 00
	<hr/>
	\$3,547 08
Sale of material.....	100 00
	<hr/>
	\$3,447 08

SIXTH STREET BRIDGE.

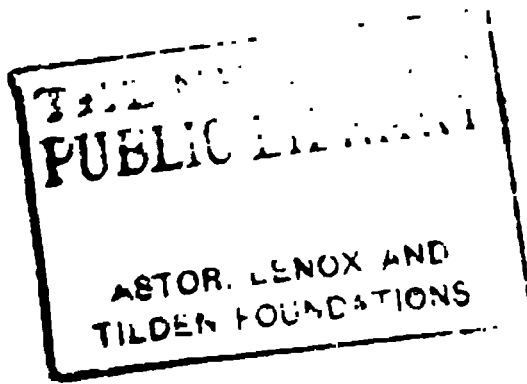
Labor	\$ 1 15
Material	112 20
Cartage	2 50
Miscellaneous.....	3 75
	<hr/>
	\$ 119 60

FULTON STREET BRIDGE.

Labor.....	\$ 9 63
Miscellaneous	2 00
	<hr/>
	\$ 11 63

BRIDGE STREET BRIDGE.

Bridge Street bridge was completed. Kloote & VanderVeen had the contract for paving the roadway with Metropolitan block on concrete, concrete sidewalks, and fibre duct conduits laid in concrete under sidewalks.





BRIDGE STREET BRIDGE

Concrete Steel Structure Across Grand River. View Looking East

COST OF BRIDGE STREET BRIDGE OVER GRAND RIVER.

Previous to April 15, 1905

April 15, 1905, to April 1, 1906

	MAIN BRIDGE.		Total
Contract, bridge and foot bridge...	\$87,300 00	.....	\$ 87,300 00
Extras	323 28	.....	323 28
Comfort station and subway	842 53	.....	842 53
Royalty	2,500 00	.....	2,500 00
Paving, walk and conduits .....	.....	7,523 17	7,523 17
Inspection	906 40	131 60	1,038 00
Engineering	204 00	39 00	243 00
Printing and advertising	151 40	.....	151 40
Temporary sidewalk	227 05	.....	227 05
Maintaining roadway	117 44	45 35	162 79
Miscellaneous .....	.....	3 25	3 25
Total main bridge	\$92,572 10	\$ 7,742 37	\$100,314 47

APPROACHES.

Teams and filling	\$ 1,267 79	.....	\$ 1,267 79
Labor filling	505 11	.....	505 11
Labor and material	2,851 76	.....	2,851 76
Conduits	172 85	24 35	197 20
Engineering	4 00	.....	4 00
Inspection	20 00	.....	20 00
Miscellaneous .....	.....	16 26	16 26
Total approaches	\$ 4,821 51	\$ 40 61	\$ 4,862 12
Grand total	\$97,393 62	\$ 7,782 98	\$105,176 59

The above does not include the cost of paving approaches that was paid by adjacent property and amounted to \$1,697.26 for the east approach, and \$643.51 for the west approach.

WEALTHY AVENUE BRIDGE.

The work at Wealthy Avenue comprised the completion of the painting, paved roadway, and concrete sidewalks on the main bridge, the completion of the reinforced concrete arch approach at the east end and the filling for approaches. The following shows the costs :

SUPERSTRUCTURE

ITEMS	Previous to April 15, '95	April, 15 '05 to Apr. 1, '06	Total
Contract estimates.....	\$22,051 32	\$ 9,525 03	\$31,576 35
Roadway { Material.....	2,678 72	1,249 62	3,928 34
{ Labor.....	116 48	485 33	601 81
Painting { Material	77 06	23 22	100 28
{ Labor.....	48 98	846 21	895 19
Advertising and telegrams.....	17 31	2 26	19 57
Cartage.....	115 83	.....	115 83
Engineering.....	181 00	22 00	153 00
Inspection	604 61	.....	604 61
Sidewalks.....	.....	1,069 41	1,069 41
Miscellaneous	18 95	24 92	43 87
Total	\$ 25,860 26	\$ 12,748 00	\$ 38,608 26

ARCH.

Labor.....	\$ 5,261 46	\$ 2,454 06	\$ 7,715 52
Sand, gravel and cement.....	1,878 48	902 99	2,781 47
Lumber.....	1,056 70	594 95	1,651 65
Steel and iron.....	1,525 44	316 99	1,842 43
Nails, bolts, etc.....	60 82	72 31	133 13
Coal and wood.....	306 48	.....	306 48
Machinery	760 19	187 16	947 85
Tools.....	120 13	49 97	170 10

ARCH—continued

ITEMS.	Previous to April 15, '06	Apr. 15, '05 to Apr. 1, '06	Total
Cartage.....	\$ 178 23	\$ 82 53	\$ 260 76
Miscellaneous { \$74.90 } { 82.41 }	42 49	55 44	97 83
Engineering.....	382 00	58 00	440 00
Roadway pavement.....	.....	625 73	625 73
Total	\$ 11,572 42	\$ 5,400 13	\$ 16,972 55

APPROACHES.

East approach.....	\$ 2,402 58	\$ 874 32	\$ 3,276 90
West approach	420 63	1,008 89	1,429 52
Total	\$ 2,823 21	\$ 1,883 21	\$ 4,706 42

PIER FENDERS.

Engineering, advertising, etc.....	\$ 56 88	\$ 56 88
------------------------------------	-------	----------	----------

TOTAL COST.

Substructure.....	\$ 25,297 59	.....	\$ 25,297 59
Superstructure.....	25,860 26	\$ 12,748 00	38,608 26
Arch.....	11,572 42	5,400 13	16,972 55
Approaches	2,823 21	1,883 21	4,706 42
Pier Fenders.....	.....	56 88	56 88
Total	\$ 65,553 48	\$ 20,088 22	\$ 85,641 70

The following table gives an inventory of City Bridges :

INVENTORY OF BRIDGES.

(1) Location	(2) BRIDGES Portion	(3) When built	(4) Original cost	(5) % Life	(6) Life in	(7) \$ for \$1 com- pounded for a yrs.	(8) Yearly deposit (4) ÷ (7)	(9) Age in	(10) \$ for \$1 com- pounded for n yrs.	(11) Total depre- ciation (8) × (10)	(12) Re- maining value (11) - (4)
Leonard St.	Run. abut- ments, girder	1879	\$13190 00	3%	35	809 00	\$191 15	36	\$43 76	\$8173 57	\$5016 45
Fulton St. ..	Masonry	1883	19011 00	3	40	77 66	256 36	22	31 45	8063 15	11947 85
	Super-structure	1883	50448 00	3	40	77 66	369 73	22	31 45	8463 00	12465 00
Pearl St. over river. .	Sub-structure	1885	11894 00	3	40	77 66	153 15	30	27 68	4230 19	7664 81
	Super-structure	1885	30480 00	3	40	77 66	363 71	30	27 68	7290 49	13180 51
Pearl St. over W. canal	Sub-structure	1886	4315 00	3	40	77 76	54 27	19	25 97	1403 90	2911 04
	Super-structure	1886	3736 00	3	40	77 66	48 90	19	25 97	1365 04	2370 96
Sixth St.	Sub-structure...	1886	7903 00	3	40	77 66	102 53	19	25 87	2654 45	5248 55
	Super-structure	1886	30281 00	3	40	77 66	361 15	19	25 87	8755 95	13525 05
	Old abutments..	1883	1000 00	3	40	77 66	13 67	22	31 45	404 76	595 24
Bridge St. over W. canal	New abutments	1901	2370 00	3	60	116 18	30 30	4	4 31	87 28	2282 72
	Cylinder piers	1901	500 00	3	50	116 18	4 30	4	4 31	18 53	461 47
	Old girders..	1887	7040 00	3	40	77 66	90 13	18	24 12	3178 94	4860 06
Bridge St. over W. canal	New girders	1901	1600 00	3	40	77 66	30 60	4	4 31	58 79	1511 21
	Roadway	1901	1600 00	3%	30	39 36	54 68	4	4 31	235 67	1364 33
Bridge St. over E. canal	Sub-structure	1901	21020 00	2%	60	214 60	69 48	4	4 35	350 54	20669 46
Bridge St., Grand river...	Super. "	1903	103300 00	2%	80	254 60	383 95	2	2 06	819 43	90480 56

FLOOD WORK.

The raising of Turner Street south of the D. G. H. & M. Railway and the construction of the (so-called) Widdicomb dike during the season of 1904 prevented a repetition of the destructive flood of 1904. The diminutive Indian Mill Creek this time started the trouble. Owing to heavy and continuous rains, it so increased in volume that it overflowed its banks and the adjacent railroad and embankment and street, and flooded that portion of the West Side adjacent to the G. R. & I. Railway. It also flooded the plant of the Imperial Furniture Company and so threatened the Kent Works and adjacent property that it was necessary to cut away a portion of the Widdicomb dike.

Indian Mill Creek had but partially subsided when the river commenced to rise and at Myrtle Street and above came within six inches of the height of 1904. Only concerted and persistent efforts on the part of citizens and officials in reinforcing the Widdicomb dike kept the river within its channel. High water in the lower reaches of the river backed up through the sewers, flooding the lower sections adjacent to the trunk sewers.

Shortly after the high water the Mayor, on resolution of the Common Council, appointed a special committee "To consider the entire question of flood protection and prevention." The committee carefully considered the existing conditions and information at hand and reported early in July. Their recommendations were concurred in by the Common Council.

The recommendations with reference to Indian Mill

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PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS.



TURNER STREET BRIDGE

Looking East Along Indian Mill Creek. Showing Stream as Widened.

Creek provided for straightening its course, the raising of its banks, or railroad embankments, and the enlarging of all waterways under streets and railways; with reference to the river, for the raising and reinforcing of the Widdicomb dike, the construction of dock line wall and deepening of river bed.

Steps were taken at once to secure the necessary agreements and rights of way for the carrying on of this work. This proved a slow and oftentimes aggravating undertaking. In connection with Indian Mill Creek, the condemnation of land was necessary.

The question of funds for carrying on the work was referred to the committee on Ways and Means of the Common Council July 10th, 1905. In August the committee reported favorably on a resolution directing the Board of Public Works "as soon as it found it practicable to proceed in the performance of said work." Contracts were let to Joseph Rusche for rebuilding Turner street bridge and deepening and widening the creek from Broadway street to Grand River. This work was finished early in the winter.

October 2d 1905, following a communication from the Mayor, a committee of twenty men was appointed to formulate a financial plan. This committee made a partial report October 9th and on the same date a resolution was adopted instructing the Board of Public Works to at once commence work lowering the river bed and constructing walls and embankments.

Work on coffer-dams was commenced at once and machinery for drilling and crushing the rock removed and constructing wall secured. The work was continued

until in March, when the height of the river required suspension of the work.

The following statement gives the amount spent up to the end of March. A considerable portion of the expenditures, you will notice, were for equipment. It was understood when starting the work that it would be carried on to completion and equipment was secured with this in view.

STATEMENT OF EXPENDITURES ON FLOOD WORK ON GRAND RIVER.

ITEMS.	Equipment and Installation	Labor and Material
Superintendence and general expenses.....	.....	\$ 767 35
Engineering and transportation .....	.....	815 15
Coffer-dams.....	.....	5,039 66
Pumping	\$ 456 47	946 08
Quarrying-Air Compressor	2,037 08	191 87
" -Drills and Piping.....	1,154 09	858 86
" -Tools, Carts, etc.....	200 95	.....
" -Cleaning .....	.....	1,363 50
" -Blasting .....	.....	570 92
" -Moving.....	.....	4,470 47
Crushing-Crusher, Engine and Bins.....	1,082 62	994 74
Storage-Stone crushed.....	.....	394 25
Wall-Excavation .....	.....	507 52
" -Concrete in place.....	.....	6,829 47
Selling .....	.....	150 22
Total.....	\$ 4,931 21	\$ 23,400 66

From the above should be deducted :

Receipts for sale of stone and other material	\$ 758 19
Accounts receivable	2,890 69
Total	\$ 3,148 88
Net cost	\$25,182 89

There was spent on Indian Mill Creek and Turner street bridge as follows :

ITEMS	Indian Mill creek	Turner St. bridge	Total
Estimates	\$2,400 00	\$5,255 15	\$7,655 15
Material and labor	197 99	1 05	199 04
Inspection and Engineering	883 00	118 50	496 50
Miscellaneous	24 84	.....	24 84
Totals	\$3,005 33	\$5,369 70	\$8,375 03

For the protection of the section drained by the West Side ditch sewer the Lake Shore & Michigan Southern Railroad have commenced the raising of their embankment to elevation 20 city datum. The gates on the sewer are completed and a 12" centrifugal pump, to be operated by a road roller, has been installed. This pump is only sufficient in size to care for the ordinary flow in the sewer with the gates closed, and can only be considered a temporary expedient. It should be replaced with larger pumps and motors or gas engines installed in a permanent building if adequate protection is to be assured.

A similar temporary pump has been installed on the Allen street trunk sewer near Blumrich Ave. The results to be secured are limited by the size of the pump

and the ability of the old sewer, which is in a weak condition, to stand the pressure.

The costs of these pumps installed was \$1,270.52.

GRAND RIVER GAGING.

The daily water levels of Grand river at Fulton street have been taken the past year as heretofore. They are given in the following table, all elevations being reduced to city datum.

GAGE READINGS.

1906												1906														
Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day
1	1.90	8.15	1.18	1.75	.80	Sunday	.80	2.05	5.85	5.12	Sunday	1	1.90	2.75	Sunday	1.45	.65	.50	.85	1.90	1.75	4.60	4.67	4.77	2
2	1.95	2.75	Sunday	1.12	Sunday	.50	.75	Sunday	2.12	2.85	5.52	4.25	3	1.67	2.80	1.12	1.10	Sunday	.40	.70	1.70	Sunday	Sunday	3.72	4	
3	1.62	Sunday	Fourth	2.2035	Sunday	1.35	1.55	3.85	7.05	3.85	5	1.50	2.65	1.65	2.55	1.85	.80	Sunday	1.35	1.87	4.60	7.25	8.25	6
4	1.50	10.60	1.90	Sunday	1.75	.80	1.62	1.50	1.37	4.72	7.15	3.22	7	1.80	14.20	2.20	1.85	1.85	.20	1.97	1.70	Sunday	4.67	6.67	Sunday	8
5	2.05	18.12	2.75	1.35	1.10	Sunday	2.15	1.35	1.50	4.67	5.90	3.55	9	1.85	18.42	Sunday	1.20	.80	.05	2.40	1.30	1.80	4.47	5.90	3.55	9
6	2.20	17.70	2.60	1.00	Sunday	.15	2.35	Sunday	1.67	4.20	5.15	4.50	10	2.20	17.70	2.60	1.00	Sunday	.15	2.35	Sunday	4.20	5.15	4.50	10	
7	2.75	Sunday	2.80	.80	.50	.15	2.15	1.35	1.65	Sunday	Sunday	5.05	11	2.75	Sunday	2.80	.80	.50	.15	2.15	1.35	Sunday	Sunday	5.05	11	
8	3.82	15.25	3.02	.60	.35	.20	Sunday	1.50	1.35	3.20	4.15	5.10	12	3.82	15.25	3.02	.60	.35	.20	Sunday	1.35	3.20	4.15	5.10	12	
9	4.57	13.80	3.45	Sunday	.30	.20	1.60	1.15	1.20	3.00	3.70	5.17	13	4.57	13.80	3.45	Sunday	.30	.20	1.60	1.20	3.00	3.70	5.17	13	
10	Sunday	12.52	3.62	.40	.35	.20	1.77	1.10	Sunday	3.85	8.25	5.85	14	Sunday	12.52	3.62	.40	.35	.20	1.77	Sunday	3.85	8.25	5.85	14	
11	6.55	11.15	3.35	.85	.35	Sunday	1.60	.65	1.07	3.50	8.00	Sunday	15	6.55	11.15	3.35	.85	.35	1.60	.65	1.07	3.50	8.00	Sunday	15	

GAGE READINGS -- Continued.

1905												1906			
Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day		
16	6.82	9.85	Sunday	1.30	.35	.05	1.52	.45	2.47	3.15	2.65	6.77	16		
17	6.80	6.70	2.50	1.50	Sunday	.20	1.40	Sunday	2.45	3.10	2.82	6.95	17		
18	6.55	Sunday	2.10	1.45	1.66	2.45	1.35	.55	2.20	Sunday	Sunday	7.05	18		
19	6.05	5.42	1.85	2.20	1.85	3.25	Sunday	.80	2.90	2.55	2.02	6.70	19		
20	5.90	5.00	1.57	Sunday	2.15	3.17	1.07	.80	3.15	2.45	1.85	5.87	20		
21	Sunday	4.05	1.30	3.05	2.45	2.80	1.00	1.05	5.95	4.25	1.75	4.80	21		
22	4.45	3.45	1.07	2.62	2.35	Sunday	.80	1.05	8.27	.....	1.35	Sunday	22	
23	3.80	3.00	Sunday	2.20	1.95	2.40	.92	1.22	9.77	4.80	1.25	3.65	23		
24	3.25	2.62	.75	1.65	Sunday	2.10	.97	Sunday	10.65	5.82	1.35	3.80	24		
25	2.77	Sunday	.60	1.15	1.80	1.95	1.05	Xmas	11.50	Sunday	Sunday	2.90	25		
26	2.95	2.35	.35	.95	1.00	1.70	Sunday	.75	11.65	6.82	1.80	2.65	26		
27	4.02	1.97	.25	Sunday	.85	1.37	.75	1.15	11.17	6.47	3.50	2.37	27		
28	Sunday	1.80	.85	.60	.75	1.80	1.80	1.87	Sunday	5.65	4.90	2.25	28		
29	4.42	1.45	1.55	.65	.65	Sunday	1.85	1.85	9.15	.....	5.55	Sunday	29	
30	Decora- tion day	1.25	Sunday	.45	.55	.87	Thanks- giving	2.10	8.10	.....	5.87	1.80	30	
31	3.50	.....	2.25	.80	.....	.87	.....	Sunday	6.97	.....	5.80	.....	31

During the years 1903 and 1905 this department was furnished by the United States Geological Survey with a current meter to determine the discharge of Grand river at various stages. The information secured was transmitted to the survey. Mr. Horton, hydrographer for this district, has furnished a rating table for Grand river at Fulton street, which is hereto attached. This, with our gage readings, will be of special value to those interested in the water power development.

**DATA FOR RATING TABLE GRAND RIVER, FULTON
STREET, GRAND RAPIDS, MICH.**

Elev. Water Surface	Discharge C. F. S.	Difference
0	1700	....
1	2770	1070
2	3860	1090
3	5000	1140
4	6200	1200
5	7500	1300
6	8900	1400
7	10500	1600
8	12400	1900
9	14640	2240
10	17160	2520
11	20000	2840
12	23100	3100
13	26560	3460
14	30340	3780
15	34400	4060
16	38600	4200
17	43000	4400
18	47450	4450

OPENING OF STREETS.

During the past year the old street opening work has been disposed of and the accounts show March 31st, 1906, \$1,151.64 cash on hand, accounts in the city treasurer for collection, amounting to \$60.79. In addition to the above, the inventory shows tool house valued at \$500.00 and tools valued at \$25.00. The Common Council appropriated \$1,000.00 for carrying on the street opening work.

During the past year it has been found necessary to have a force devoting considerable time to repairing plumbers' trenches. The general fund has been called upon to carry such pay rolls and the expenses of inspectors on corporation work until bills are collected. Your arrangement with the comptroller and treasurer to use the old Street Opening fund for this purpose will bring such items under one fund and obviate the confusion heretofore existing.

There were issued during the year permits for opening streets to the number of 1,425, divided as follows:

Sewer connections.....	270
Water connections.....	292
Sewer and water connections.....	491
Miscellaneous repairs.....	363
Cancelled.....	9
	<hr/>
	1,425

It has been the policy of the department to inspect all streets after completion of the work as well as the work itself. The parties opening streets are notified where repairs are found necessary and when not made within ten days, repairs are made and accounts collected.

The trenches in paved and the better class of gravel streets are rolled with the steam rollers. Some of the plumbers give the department orders to repair their trenches at their expense.

The cost of work under the charge of this department during the past year is divided as follows :

Cost of street improvements, \$254,932 upon which has been paid \$54,927 27	
Paid in settlement of old work..... ..	60,292 80
Cost of sewers..... ..	127,835 00
Cost of conduits..... ..	5,361 60
Cost of bridge repairs..... ..	3,578 31
Cost of completion of bridges..... ..	35,613 57
Cost of water works extensions, mains..... ..	38,720 39
FLOOD WORK —	
On Grand river..... ..	25,182 39
On Indian Mill creek..... ..	3,005 88
On Turner street..... ..	5,899 70
Flood pumps..... ..	1,270 52
TOTAL..... ..	\$361,156 88

The following table shows the expenses of the department for the year. Your attention is called to the fact that \$14,788.41 of this is collected from various funds, individuals and corporations :

EXPENSES.

Salaries (charged to General Fund)..... ..	\$ 9,306 58
Salaries (charged to Special Improvements)..... ..	5,778 74
OFFICE —	
Abstracts (for street openings)..... ..	104 40
Postage and express..... ..	20 21
Library..... ..	54 84
Printing (including improvement specifications)..... ..	141 25
Telephones, telegraph and messengers..... ..	17 68
Traveling expenses..... ..	70 20
Stationery, pencils, ink, etc..... ..	108 86
Water..... ..	9 75
Typewriter..... ..	16 75
Furniture and files..... ..	110 69

DRAFTING AND BLUE PRINTING —

Blue prints	74 40
Steel rules, computers, etc	18 50
Tracing	37 66
Map	23 68
Books	90 46
Miscellaneous	70
Ink	8 15

FIELD —

Carfare	485 13
Livery	311 15
Repairs	68 26
Supplies	12 41
Testing	44 69

INSPECTION —

General.....		\$	77	20	
Corporation.....			498	90	
Improvements.....			4,251	61	
Sewers.....			1,816	52	
Detention hospital.....			89	55	
Turner street bridge.....			8	50	
W. W. Ext. material inspection.....			67	13	
W. W. Ext. laying inspection.....			151	88	
W. W. laying inspection			468	94	
Street opening.....	{	Work.....	1,204	19	
		Street.....	425	25	9,009 67
TOTAL.....					\$25,919 81

No comment need be made on the large amount of detail work required by the Common Council in making estimates, surveys, and maps for street openings, securing rights of way for flood work, as well as attending to the numerous calls of plumbers, citizens, and others wishing information.

Respectfully submitted,
L. W. ANDERSON,
City Engineer.



THIRTY-FOURTH

ANNUAL REPORT

OF THE

★
Board of Public Works

TO THE

COMMON COUNCIL

OF THE

City of Grand Rapids, Mich.

TRANSMITTING THE REPORTS OF THE SECRETARY AND
GENERAL MANAGER, CITY ENGINEER, CHIEF
CLERK AND CHIEF INSPECTOR.

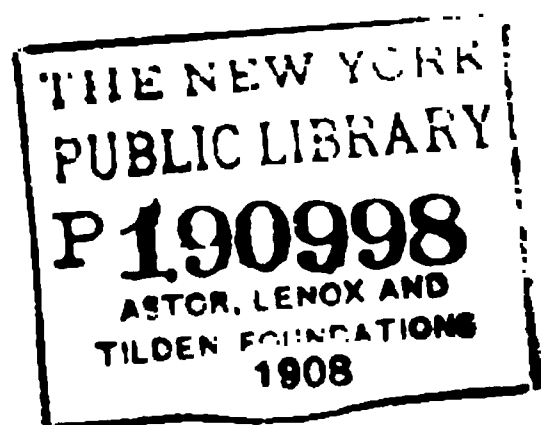
FOR THE

YEAR ENDING MARCH 31, 1907.

GRAND RAPIDS, MICH.
PRESS OF WEST MICHIGAN PRINTING CO.
1907.

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REPORT

OF THE

BOARD OF PUBLIC WORKS.

GRAND RAPIDS, MICH., April 1, 1907.

To the Honorable Common Council:

GENTLEMEN:—Herewith are transmitted Annual Reports from the Departments of the Municipal Government under the jurisdiction of this Board, also inventories covering the Water Works and Electric Lighting systems and City Bridges.

Respectfully submitted.

JAMES E. KEEGAN, President,
GEORGE C. PEIRCE,
CHARLES M. WILSON,
*CHARLES A. GREENMAN,
HENRY J. KLEVORN,
WM. M. GORMLEY,
GEORGE E. ELLIS, Mayor.

*Died Jan. 30, 1907.

REPORT OF SECRETARY AND GENERAL MANAGER.

OFFICE OF THE BOARD OF PUBLIC WORKS }
Grand Rapids, Mich., April 1, 1907. }

To the Honorable Board of Public Works:

GENTLEMEN:—We respectfully submit to your Honorable Body a resume of the work accomplished by the several departments of the City Government under your jurisdiction, for the year ending March 31, 1907, viz:

Annual statements covering Water Works System, Electric Lighting System and Engineering Department.

Inventories covering Water Works and Electric Lighting Systems and Bridges.

WATER WORKS.

TOTAL INVESTMENT AS SHOWN BY BOOKS.

Distributed as follows:		Charged off.	Removed.
Water mains	\$1,203,960.94	\$43,128.55	\$134,458.13
Pumping Station (property)	70,218.26	17,786.55	281.39
Pumping Station (machinery) ..	207,120.01	75,921.98	31,433.99
Reservoirs	118,330.66	27,329.06	28,700.10
Intakes	29,280.72	3,493.32	18,831.08
Standpipes	32,396.10	5,574.53	
Meters and connections	84,963.38	8,179.34	3,169.94
Surveys, engineering, etc., on new water supply	15,602.39	12,805.26	
Miscellaneous maintenance amounts improperly charged and classified	46,976.63	46,976.63	
For lowering water mains and services on improved streets paid from Extension Fund (transferred to maintenance account)	7,676.48	7,676.48	
	\$1,811,525.57	\$248,871.70	\$216,874.63

LEAVING PRESENT VALUES

Water mains	\$1,026,374.26
Pumping Station (property)	52,150.82
Pumping station (machinery)	99,764.04
Reservoirs	57,301.50
Intakes	6,956.32
Standpipes	26,821.57
Meters and connections	73,614.10
New water supply (surveys, etc.)	2,797.13
	\$1,345,779.24

You will please notice that the total value of the Water Works System according to the book account is \$1,811,525.57 and that the depreciation, discarded apparatus, etc., amounts to \$465,746.33, leaving an actual value of \$1,345,779.24.

ELECTRIC LIGHTING SYSTEM.

The book value of the Electric Lighting System on March 31, 1907.....	\$213,832.50
We have charged off for depreciation.....	47,973.99
Leaving an actual value of.....	<u>\$165,858.51</u>

BRIDGES.

Original cost.....	\$343,927.00
Depreciation.....	59,418.99
Remaining value.....	<u>\$284,508.01</u>

The large amount charged off from the Water Works properties is due principally to the old wooden water pipe, boilers and engines which were discarded long ago and have been carried on the books at their original costs.

There are also a few such items in the Electric Lighting Department, but the bulk of the amount charged off for depreciation on these properties is for natural wear and tear and on account of the initial cost of electrical apparatus being less than when the system was installed.

The total costs per lamp per annum for operating the Electric Lighting Department (including fixed charges, etc.) are as follows:

Maintenance and operation.....	\$36.80
Loss through non-taxation.....	2.88
Depreciation.....	7.00
Bond interest	6.41
Interest on balance of investment which was raised through general taxes	4.55
	<hr/> \$57.64

Just prior to the installation of the Municipal Lighting System the City was paying a private corporation \$97.00 per lamp per annum.

For the kind and courteous co-operation of your Honorable Body and for the loyal performance of duty on the part of the heads of departments and all employes of this Board, acknowledgement is hereby given.

Respectfully submitted,

SAMUEL A. FRESHNEY,
Secretary and General Manager.

REPORT OF CHIEF CLERK.

SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR:—Herewith is presented Annual Report of the Water Works System and Lighting Plant showing the cost of operation and maintenance of the Pumping Station, Lighting Plant and Water Works System; also financial statements pertaining thereto.

WATER WORKS FUND.

Annual statement of receipts and disbursements for the year ending March 31, 1907.

REPORT OF BOARD OF PUBLIC WORKS

TOTAL RECEIPTS		TOTAL DISBURSEMENTS	
For water rates.....	\$189,865.17	Maintenance of Station.....	\$36,435.93
For water for fire hydrants, (1,527).....	15,270.00	Distribution	11,960.89
For water for flushing sewers	2,000.00	Inspection dept.....	3,829.29
For water furnished fire en gine houses.....	275.00	Office dept.....	3,426.52
For water permits	2,422.50	Construction.....	16,808 35
For plumbers licenses	410.00	Refunded water rates	154.71
Reading and repairing water meters	9,930.40		
For sale of water meters.....	497.60		
For setting water meters	1,241.98		
For sale of material.....	5,274.15		
City orders returned.....	3.25		
Totals.....	\$176,690.05	Totals.....	\$72,615 69

DETAIL OF RECEIPTS AND DISBURSEMENTS.
STATION.

	Cr.	Dr.	Cr. Bal.	Dr Bal.
Superintendence.....		\$ 666.07		
Engineers.....		2,961.81		
Fireman, Helpers, etc.....		5,775 95		
Clerks.....		225.01		
Buildings and grounds.....		301.04		
Engines	\$ 8.41	955.58		
Boilers	72.94	1,404.07		
Coal		22,540 43		
Oils.....	58.63	498 77		
Waste.....	31 63	319.52		
Supplies and Tools	8.12	747.46		
Books		39.62		
	\$179.73	\$36,435.93		\$36,256 20

DISTRIBUTION.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Superintendence.....		\$1,686.66		
Clerks.....		524 99		
Repairing water mains.....	\$ 8.63	961.18		
Reading water meters.....	4,965.20	1,436.17		
Repairing water meters	4,971.20	1,331.99		
Supplies and tools.....	134.24	660 51		
Stables.....		969.36		
Reservoir		39.37		
Fire hydrants	55.63	898.47		
Sprinkling cranes	44.00	53.76		
Street valves.....	3 30	137.75		
Services.....	3,103.95	2,470 95		
Shop and storeroom.....	21 05	406.35		
Books		230.88		
Intake.....		154 50		
	\$13,307.19	\$11,960.89	\$1,346.30	

INSPECTION DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Chief Inspector and Assistants.....	\$ 67.75	\$3,473.07		
Stables		219.96		
Car tickets.....		115.00		
Supplies		3.26		
Telephone		18.00		
	\$ 67.75	\$3,829.29		\$3,761.54

OFFICE DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Four bookkeepers and stenographer		\$3,376.29		
Books, blanks, etc		544.71		
Postage		82.06		
Telephones		13.80		
Office supplies	\$20.00	186.44		
Office expenses.....		223.23		
	\$20.00	\$3,426.53		\$3,406.52

EXTENSION AND CONSTRUCTION.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Buildings and grounds		\$ 95.84		
Machinery		154.83		
New mains.....	\$4,042.40	7,931.97		
Setting meters	1,241.98	1,112.29		
New water meters.....	497.60	4,602.48		
Supplies	9.98	112.83		
New water supply.....		2,797.13		
	\$5,791.96	\$16,808.35		\$11,016.39

COLLECTION DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Water rates collected	\$139,365.17			
Deposited to sinking fund.....		\$68,993.88		
Returned rebates.....	3.25			
Refunded water rates		154.71		
For water for fire hydrants	13,270.00			
For water for flushing sewers	2,000.00			
For water furnished fire engine houses	275.00			
For plumber's licenses.....	410.00			
	\$157,323.42	\$69,148.59	\$88,174.83	

SUMMARY.

	Credits	Debits.
Cash on hand April 1, 1906.....	\$ 7,378.37	
Station.....		836 256.90
Distribution	1,346.30	
Inspection Department		3,761.54
Office Department.....		3,406.52
Construction and Extension.....		11,016.39
Collection Department.....	88,174.83	
Cash on hand March 31, 1907.....		42,458.85
	896,899.50	896,899.50
Cash on hand April 1, 1907.....	\$42,458.85	

Accts. Recv. (Material).....	\$ 197.18	Accts. Payable.....	\$ 1 084.15
“ “ (Water Rates).....	6,538.98		
“ “ (Meter Charge)....	610.30		
“ “ (Sinking Fund).....	79.76		
“ “ (Permits).....	10.00		
	<u>\$ 7,436.22</u>		<u>\$ 1,084.15</u>

Total paid for maintenance and operation previous to April 1, 1906.....	\$ 1,111,398.04
Miscellaneous construction and unclassified charges.....	214,542.69
Paid during the past year.....	42,077.96
Total paid to date.....	\$ 1,368,018.69
Total paid on construction account during past year from Water Works fund.....	11,016.39
Total paid on construction account during past year from Water Works extension fund.....	59,583.48
Total paid for construction account during past year.....	70,599.87
Paid previous to March 31, 1906.....	1,740,925.70
Total investment as shown by book to date.....	\$ 1,811,525.57
DEDUCTIONS :	
Mains and machinery abandoned and removed since the year 1873.....	\$ 216,874.63
Depreciation (as per tables following).....	181,412.33
Surveys, engineering, etc., on new water supply.....	12,805.26
Miscellaneous maintenance accounts.....	54,753.11
	<u>\$ 465,745.33</u>
Present values as shown by inventory.....	1,345,779.24

RECAPITULATION.

Bonds issued.....	\$ 1,100,000.00	Paid on construction.....	\$ 1,811,525.57
Total collections as shown by report.....	2,192,478.16	Paid for maintenance and op- eration.....	1,368,018.69
		Cash on hand (Water Works, Water Works Extension and Sinking Funds).....	112,933 90
	<u>\$ 3,292,478.16</u>		<u>\$ 3,292,478.16</u>

**ANNUAL STATEMENT OF OPERATION OF CITY PUMPING
STATION, FOR THE YEAR ENDING MARCH 31, 1907.**

	Total cost of	Aver. cost per day of	Aver. cost per 1,000,000 gals.
Coal.....	\$21,676.85	\$59.39	\$4 02
Wages	9,601.45	26.31	1.78
Supplies	2,107.65	5.78	.39
Repairs	1,650.09	4.52	.31
Oils and Grease.....	494.73	1.85	.09
Totals.....	\$35,580.77	\$97.35	\$6 59

Total pounds of coal consumed.....	15,923,948
Average pounds consumed per day.....	43,627
Average cost of coal per 2,000 pounds.....	\$2.72

COMPARATIVE STATEMENT.

	1902-03	1903-04	1904-05	1905-06	1906-07
Average gallons pumped per day.....	12,215,973	14,092,458	13,986,651	12,404,970	14,772,492
Average cost to pump 1,000,000 gallons.....	\$7.37	\$7.59	\$7.00	\$6.48	\$6 59

WATER REPORT.

Table showing the amount of water pumped into the High and Low Services for the year ending March 31, 1907, and the total pumping record.

	Total gallons pumped per month	Aver. gallons pumped per day	LOW SERVICE		HIGH SERVICE	
			Total gallons pumped per month	Aver. gallons pumped per day	Total gallons pumped per month	Aver. gallons pumped per day
April	387,426,143	12,914,205	187,348,119	6,244,987	200,078,024	6,669,268
May	466,996,198	15,064,398	215,251,714	6,943,604	251,744,484	8,120,789
June	461,450,872	15,381,695	225,077,735	7,502,591	236,373,137	7,879,104
July	532,811,935	17,187,482	273,169,353	8,811,915	259,642,582	8,375,567
August	496,585,917	16,018,881	273,375,455	8,818,563	223,209,862	7,200,318
September	525,776,516	17,525,884	286,214,682	7,985,395	239,561,834	7,985,395
October	430,262,542	13,879,437	240,073,256	7,744,298	190,189,286	6,135,139
November	400,055,034	13,335,168	225,473,568	7,515,786	174,581,466	5,819,382
December	413,671,828	13,344,253	231,914,372	7,481,109	181,757,456	5,863,144
January	429,313,290	13,848,816	239,288,666	7,718,989	190,024,624	6,129,827
February	433,997,690	15,499,918	246,887,884	8,817,425	187,109,806	6,682,493
March	413,612,220	13,342,329	230,142,680	7,423,957	183,469,540	5,918,372
Totals	5,391,959,585	14,772,492	2,874,217,484	7,874,568	2,517,742,101	6,897,924
Averages						

WATER WORKS BONDS AND INTEREST.

SERIES	DUE	Date of Issue	Date of Maturity	Com. & Ex.	Principal	Rate	Int. and Ex.	Total
Fourth	Sept. 1.....	Sept 1888...		\$7 50	\$150,000 00	5 %	\$3,757 50	
	March 1....		Sept. 1918...	7 50			3,757 50	\$7,515 00
Fifth.....	May 1	May 1889....		4 00	80,000 00	5 %	2,004 00	
	Nov. 1.		May, 1909...	4 00			2,004 00	4,008 00
Sixth	Jan. 1.....	Jan. 1892....		13 50	300,000 00	4½ %	6,763 50	
	July 1.....		Jan. 1912....	13 50			6,763 50	13,527 00
Refund	Oct. 1.....	Oct. 1893....		10 12	225,000 00	4½ %	5,072 62	
First.....	April 1.....		Oct. 1913....	10 12			5,072 62	10,145 24
Refund	June 1.....	June 1895....		4 00	100,000 00	4 %	2,004 00	
Second	Dec. 1.....		June 1915....	4 00			2,004 00	4,008 00
Ninth	July	July 1903 ...	July 1923 ...		80,000 00	3½ %	1,400 00	
	Jan. 1.....		July 1923 ...				1,400 00	2,800 00
Tenth	July 1.....	July 1904 ...			90,000 00	4 %	1,800 00	
	Jan. 1.....		July 1924 ...				1,800 00	3,600 00
Eleventh	August 15...	August 1906.			75,000 00	4 %	1,500 00	
	Feb. 15.....		August 1926.				1,500 00	3,000 00
					\$1,100,000 00			\$48,603 24

WATER WORKS SINKING FUND.

	Credit	Debit
Cash on hand April 1, 1906.....	\$12,470.83	
Accrued interest from sale of bonds.....	558.33	
¼ of receipts from sale of water.....	68,993.88	
Interest and exchange on bonds.....		\$47,103.24
Interest and premium on P. M. Ry. bonds....		261.22
Cash on hand March 31, 1907.....		34,658.58
	\$82,023.04	\$82,023.04

Cash on hand April 1, 1907..... \$34,658.58
Accts. receivable (Water rates).. 6,538.98 Accts. payable \$79.76

WATER WORKS EXTENSION FUND.

	Credit	Debit
Cash on hand April, 1906.....	\$20 399.95	
Sale of bonds.....	75,000.00	
Sale of material.	7,276.90	
Disbursements		\$66,860.88
Cash on hand March 31, 1907.....		35,816.47
	\$102,676.85	\$102,676.85

Cash on hand April 1, 1907..... \$35,816.47
Accts. receivable..... 31.32 Accts. payable..... \$781.84

LIGHTING PLANT.

ANNUAL STATEMENT YEAR ENDING MARCH 31, 1907.

OPERATION.

RECEIPTS.

Budget appropriation, maintenance and operation..	\$ 27,000.00
Budget appropriation, painting and repairing towers	1,000.00
Transferred balance from painting and repairing towers	500.00
Material sold	185.51
	<hr/>
	\$ 28,685.51

DISBURSEMENTS.

STATION.

Superintendence	\$ 1,333.20
Clerk	450.00
Engineers	1,920.00
Firemen and helper.....	1,847.73
Dynamo-tenders.....	1,432.50
Trimmers and linemen	3,551.92
Buildings and grounds.....	138.66
Engines.....	360.88
Boilers.....	390.57
Coal.....	10,622.86
Oils.....	308.78
Waste and wipers.....	115.58
Dynamos	170.96
Switchboard and connections.....	7.61
Supplies and tools.....	510.78
Books.....	43.62
	<hr/>
	\$ 23,205.15



BRIDGE STREET BRIDGE

crete Steel Structure Across Grand River. View Looking East

DISTRIBUTION.

Lines and cables	\$ 308.68
Lamp posts	2.13
Towers	338.51
Lamps (including salary of repairer)	1,243.45
Globes	986.27
Carbons	1,248.73
Trimming	182.55
Stables	881.77
Books	43.38
Telephone	12.00
	<hr/>
	\$ 5,247.47

OFFICE.

Clerks	224.98
Printing and stationery	24.25
Office supplies	30.98
	<hr/>
	\$ 280.19

Total disbursements	28,732.81
Cash on hand April 1, 1906	5,181.66
Total receipts.	28,685.51
Cash on hand April 1, 1907	5,134.36
	<hr/>
	\$33,867.17 \$ 33,867.17

Total amount paid for maintenance and operation previous to April 1, 1906	158,971 12
Paid during past year	28,732.81
	<hr/>
Total amount paid to date	\$185,703.93

EXTENSION AND CONSTRUCTION.

RECEIPTS.

Budget appropriation	\$ 2,500.00
Material sold (credit lines and cables)	790.47
	<hr/>
Total receipts	\$ 3,290.47

DISBURSEMENTS.

Steam plant.....	\$ 612.14	
Electric plant.....	.88	
Lines and cables	2,703.18	
Conduits.....	4.59	
Ornamental poles.....	19.13	
Arc lamps.....	634.29	
Supplies and tools.....	1.80	
Total disbursements.....		\$ 3,976.01
Cash on hand April 1, 1906.....	739.93	
Total receipts.....	3,290.47	
Cash on hand April 1, 1907.....		54.39
	\$ 4,030.40	\$ 4,030.40

AGGREGATE OF BALANCES.

Balance in operation fund.....	5,134.36	
Balance in extension fund.....	54.39	
Total balance in fund.....	\$ 5,188.75	
Total amount paid for construction previous to April 1, 1906		210,646.96
Paid during past year.....		3,185.54
Total amount paid on construction to date....		\$213,832.50
Less depreciation (per inventory) to date.....		47,973.99
Present value of plant.....		\$165,858.51

INVENTORY.

Engines	\$ 15,109.54
Boilers	17,576.98
Crane.....	1,330.05
Dynamos and connections.....	13,521.35
Building	43,043.94
Towers	8,925.56
Lines and cables.....	65,573.90
Supplies	777.79
Total	\$165,858.51
Supplies and tools for Station.....	\$ 2,012.02

BONDS ISSUED.

\$125,000.00 issued May 1897, due May 1917, 4 per cent int. \$7.00 exchange, total interest and exchange \$5,007.00.

SUMMARY.

**ANNUAL STATEMENT OF OPERATION OF THE CITY LIGHT-
ING PLANT, YEAR ENDING MARCH 31, 1907.**

	Total cost	Average cost per day	Aver.cost per lamp per day	Aver.cost per kilo- watt hr.	Aver.cost per lamp hour
Coal	10,735.88	29.41	.0376569	.007655	.004
Wages	11,631.93	31.87	.0408066	.008295	.00483
Carbons.....	1,087.68	2.98	.0038156	.000776	.00041
Globes.....	1,092.98	2.99	.0038284	.000778	.00041
Repairs	1,671.52	4.58	.0058643	.001192	.00062
Supplies.....	2,178.38	5.97	.0076441	.001554	.00081
Oils	342.55	.94	.0012036	.000245	.00012
Totals.....	28,740.90	78.74	.1008195	.020495	.0107

Total pounds of coal consumed.....	7,550,068
Average pounds consumed per day	20,683
Average cost of coal per 2,000 pounds.....	\$ 2.844
Average kilo-watt hours per day	3,842
Average number of lamps in circuit per day	786
Average number of lamps reported out per day	5
Average number of lamps operated per day	781
Average number of hours operated per day	10.24
Average cost per lamp per year computed on above basis	\$ 36.80
Total number of lamp hours	2,684,011
Average number of lamp hours per day.	7,353
Average cost per lamp-hour (operation only).....	.00743
Average cost per lamp-hour (distribution only).....	.00327

COMPARATIVE STATEMENT.

	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07
No. of lamps operated ..	581	578	623	687	726	781
Average cost per lamp per year (above basis).	\$40.99	\$43.40	\$43.85	\$40.36	\$35.14	\$36.80

Contract price before plant was built was, in first contract \$120.00 per lamp per year. In second contract, \$107.00 per lamp per year. Contract price just prior to the installation of the Municipal Plant was \$97.00 per lamp per year.

LIGHTING MUNICIPAL BUILDINGS.

CONSTRUCTION.

STATEMENT OF RECEIPTS AND DISBURSEMENTS
UP TO MARCH 31, 1907.

Receipts	Disbursements
Total appropriations. \$9,000.00	Printing and advertising. \$ 111.06
	Machinery..... 3,971 40
	Foundation 336.01
	Switch board and connec. 30.48
	Interior wiring..... 1,390.77
	Lines and cables..... 1,749.05
	Engineering. 51.00
	Meters and instruments.. 81.28
	<u>\$7,771.05</u>
<u>\$9,000.00</u>	

Cash on hand April 1, 1906....\$7,140.85

Disbursed during past year...

\$5,911.90

Cash on hand March 31, 1907..

1,228.95

\$7,140.85

\$7,140.85

Cash on hand April 1, 1907... 1,228.95 Accts. payable: -

City hall wiring.... 2,953.00

REVENUE ACCOUNT.

Receipts.	Disbursements
From sale of current.....\$ 201.00	Printing.....\$ 2 25
From sale of lamps..... 26.22	Lamps 90.44
	Oils 45.45
	Supplies 2.25
	Insurance 32.00
<hr/> \$ 227 22	<hr/> \$172.89

Total receipts..... \$227.22

Total disbursements.....

\$172.89

Cash on hand March 31, 1907...

54.83

\$227.22

\$227.22

Cash on hand April 1, 1907..... 54.83

Accts. payable

For coal..... \$405.53

Accts. receivable

For sale of current..... \$45.78

This fund was provided for the purpose of lighting public buildings. The machinery, which consists of one 105K W. Fort Wayne Generator direct-connected to a 14 in. x 15 in. Skinner Engine is installed and in operation and at the present time we are lighting the Grand Rapids Public Library and within fifteen days will be supplying current to the City Hall. Arrangements are under way for furnishing current to the Police Headquarters and No. 4 Engine House.

This machinery is installed in the City Pumping Station Building and is operated by the employes of the Station, so that the labor charge for operating same is practically nothing.

The fund is charged with the coal consumed neces-

sary to operate its machinery in accordance with its output.

The City Pumping Station is lighted from this unit and is charged accordingly.

GAS TESTING DEPARTMENT.

This department was established and ordered equipped with the necessary apparatus to be able to test gas pressures, gas meters and other gas appliances, in accordance with the City ordinance governing same.

	Credit	Debit
Cash on hand April 1, 1906.....	\$1,812.35	
Piping and connections.....		\$ 18.90
Test meter.....		5.57
Pressure gauges.....		8.75
Printing and charts.....		8.97
Testing		110.00
Cash on hand March 31, 1907.....		1,660.16
	\$1,812.35	\$1,812.35

Cash on hand April 1, 1907..... \$1,660.16 Accts. payable..... \$5.00

Respectfully submitted,
JAS. A. KINNEY,
Chief Clerk.

ANNUAL REPORT OF THE INSPEC- TION DEPARTMENT.

Grand Rapids, Mich., April 1, 1907.

MR. SAMUEL A. FRESHNEY,

*Secretary and General Manager, Board of Public
Works.*

DEAR SIR:

Herewith is presented the Annual Report of the Inspection Department for the year ending March 31, 1907.

WATER SERVICES.

Number of schedule services.....	9,701
" " metered services.....	4,618
" " services to curb or lot line only.....	744
" " " for fire protection.....	135
" " " " elevator	40
" " " " water troughs	50
	15,288

DISTRIBUTED IN THREE DISTRICTS AS FOLLOWS:

NORTH DISTRICT.

Schedule.....	3,563
Metered	1,592
To curb or lot line.....	323
	5,478

SOUTH DISTRICT.

Schedule.....	3,608
Metered	1,612
To curb or lot line.....	368
	5,588

WEST DISTRICT.

Schedule.....	2,530
Metered	1,414
To curb or lot line.....	53
	3,997

Total number of tapping permits issued from April 1, 1906 to April 1, 1907.....	961
Total number of meters in service for which the consumers have advanced to cost.....	1,176
Total number of services cut off at main and abandoned.....	227
Total number of services discontinued and gone to Hydraulic Co...	171

Embodied in the following statement is a report of the work done by the Inspectors employed in this department during the past year.

Number of house inspections made.....	3,556
“ “ inspections and investigations made and notices served.	13,563
“ “ meter readings.....	30,600
“ “ water services to curb inspected.....	372
“ “ high reading meter notices served.....	1,462
“ “ water waste notices served.....	448
“ “ notices to property owners to make water connections..	463
“ “ leaks found and owners notified.....	1,418
“ “ services turned on.....	1,095
“ “ services turned off.....	1,013
“ “ fixtures capped and uncapped.....	65

METERS.

In the following table are shown the number, kind and size of meters in service on March 31, 1907.

METERS IN SERVICE APRIL 1, 1907.

	5/8 in.	3/4 in	1 in.	1 1/2 in.	2 in.	3 in.	4 in.	6 in.	Totals
Nash.....	2,183	112	50	3	12	.....	2	.....	2,352
Worthington.	208	19	43	.....	16	.....	1	.....	288
Crown	1,218	153	89	3	28	1	8	1	1,496
Thomson	1	1	.....	.....	1	.....	.....	.....	3
Trident	214	6	3	2	.....	.....	1	.....	226
Rotary	1	.....	.....	4	.....	.....	1	.....	6
Duplex.....	5	.....	.....	.....	.....	.....	.....	.....	5
Gem .....	.....	.....	.....	.....	4	6	16	2	28
Hersey	8	6	19	.....	5	.....	.....	.....	38
Lambert.....	10	4	.....	.....	.....	.....	.....	.....	14
Empire	95	34	6	.....	15	.....	.....	.....	150
Keystone.....	2	.....	.....	.....	.....	.....	.....	.....	2
	8,945	336	210	12	81	7	23	3	4,618

Percentage of water service metered..... 30%

On services where a meter has been installed no record is kept of the water fixtures.

WATER FIXTURES ON SCHEDULE SERVICES.

Baths.....	3,388
Hopper closets.....	1,904
Tank closets.....	6,316
Basins.....	2,993
Kitchen sinks.....	4,421
Urinals.....	78
Yard hydrants.....	5,147
Sill cocks.....	6,924
Hydraulic pumps	402
Water troughs.....	50
Sprinkling cranes.....	6
Miscellaneous fixtures.....	592
	32,216

Distributed in the several districts as follows:

WARDS.	BATHS.	Hopper Closets	Tank Closets	BASINS	SINKS
First and twelfth.....	195	141	415	178	337
Tenth and eleventh.....	1248	443	1818	949	1194
Third	781	417	1463	821	1016
Second, fourth and fifth.....	710	441	1532	694	1193
Sixth and seventh.....	263	329	664	196	408
Eighth and ninth.....	168	133	390	133	246
Engine houses.....	18	.....	24	18	23
Parks!.....	.....	.....	.....	.....	.....
Cemeteries.....	.....	.....	10	4	4
Totals.....	3383	1904	6316	2993	4421

WARDS.	Uri- nals	Hy- drants	Sill Cocks	Hydral'o Pumps	Water Troughs	Sprink'g Cranes	Miscel- laneous	Totals
1st and 12th...	35	570	552	4	6	.....	56	2489
10th and 11th..	5	936	2253	102	9	.....	65	9022
3rd.....	1	696	1385	182	2	.....	216	6980
2d, 4th and 5th	16	1343	1431	90	14	4	172	7640
6th and 7th....	.....	1025	752	20	14	1	36	3708
8th and 9th....	1	531	516	4	5	1	24	2152
Engine houses	20	12	35	.....	.....	.....	23	173
Parks .....	.....	24	.....	.....	.....	.....	.....	24
Cemeteries....	.....	10	.....	.....	.....	.....	.....	28
Total.....	78	5147	6924	402	50	6	592	32216

HOUSE INSPECTIONS.

As shown elsewhere in this report there were 3,556 house inspections made during the past year. As usual a large number of leaks were found, and notices were served on consumers to have repairs made at once. 448

places were found where water was being wasted, and I would recommend that where notices to "stop the waste" have been served and not complied with that a meter be installed at once on such services. I would further recommend that the work of house inspection be continued to completion the present year.

Respectfully submitted.

ADOLPH WURZBURG,
Chief Inspector.

REPORT OF CITY ENGINEER.

Grand Rapids, Mich., May 1, 1907.

MR. SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR Sir:—

Herewith is presented the Annual Report of the work done by the Engineering Department during the fiscal year ending March 31, 1907.

STREETS.

3.581 miles of streets have been added to the total mileage of 288.011 reported a year ago. 178.636 miles have been improved, leaving 112.956 or about 38 per cent of the total mileage still unimproved.

STREET IMPROVEMENTS.

Street improvement bonds to the amount of \$200,000.00 were issued during the year. Most of the work was ordered and contracted for early in the year. Delay on the part of the Grand Rapids Railway Company in securing rails and the scarcity of labor, very materially delayed pavements, but all brick work except a short piece on W. Bridge Street over the West Side Ditch Sewer, was completed before winter. Some of the gravel streets were delayed by the water pipe, but all were put in good condition for winter.

Metropolitan, Trimble and Nelsonville Blocks were used. All brick were tested on cars and a more uniform and better quality of brick have never been shipped into the City than were received during the year.

The Grand Rapids Railway Company laid their tracks in Scribner, West Bridge, Stocking and South Division streets with "T" rails. Grooves for the wheel flanges were formed by specially moulded rail blocks and on some of the intersections, granite rail blocks were used.

The grooves on South Division Street were formed entirely with granite blocks. The new form of rail with grooved blocks gives a much better appearing street, spreads travel, and prevents heavy loads being compelled to remain on tracks until reaching an intersection.

The work completed and the new work contracted for during the past year is shown in the following table:

WORK LEFT OVER FROM 1905. COMPLETED IN 1906.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	Width of Road- way	DIMENSIONS			COST		Amount paid on Contract	CONTRACTORS
			Length of Street	Length of curb	No. of Sq. Yards	Contract Price	Amount of Roll		
Wealthy Ave.....	S. Ionia to Ellsworth.....	38	959	357	5000	\$10995 00	\$11520 00	.....	Kloote & VanderVeen
W. Bridge	Stocking to Garfield.....	38	3564	Old	16732	27519 00	29355 00	.....	Chas. J. Carpenter
Canal	Leonard to Travis Ave.....	34	3286	5212	12671	25000 00	25700 00	.....	Jas. McDermott & Son
Scribner	W. Bridge to Seventh.....	40	2586	Old.	12015	22904 00	23384 00	.....	Jas. McDermott & Son
Scribner	Seventh to Webster.....	40	4490	Old.	20610	38957 00	39687 00	.....	Jas. McDermott & Son
MACADAM (Re-surfacing.)									
Jefferson Ave.	Fifth Ave to Hall.....	36	2576	Old.	.....	\$ 5828 00	\$ 6720 00	.....	Jas. McDermott & Son
CONCRETE.									
Cornwall Ave.....	Pleasant to Fifth Ave.....	24	1003	.....	2610	\$ 2858 00	\$ 3070 00	.....	Kloote & VanderVeen
Lake & Auburn A. Alleys.....	.....	16	471	32	868	1313 00	1475 00	.....	Concrete Con. Co.

GRADED, GRAVELED AND GUTTERS PAVED.

STREETS	EXTENT	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll	
Adams	Madison Ave. to S. East.....	26	2564	5275	.....	\$ 9740.00	\$10150.00	Fred Gilner
W. Bridge.....	Ditch to City Limits .....	.....	.....	.....	.....	18000.00	22625.00	John Hlaeshutter
Canal	Travis Ave. to Dean.....	34	928	1971	.....	5000.00	5265.00	Jas. McDermott & Son
Carleton Ave....	Lake to Wealthy Aves.	26	750	1534	.....	3075.00	3385000	Kloote & Vander Veen
Trowbridge	Clancy to N. Prospect ..	26	587	1152	....	3680.00	3865.00	J. B. Hoey
*Winter	Shawmut Ave. to Watson.....	26	1513	.....	.....	5349.00	.....	J. B. Hoey

*Paid by P. M. Ry.

WORK LET FROM APRIL 1, 1906, TO APRIL 1, 1907.

PAVED WITH BRICK ON CONCRETE FOUNDATION.

Erie.....	Canal, West	30	194	55	728	\$ 1700.00	\$ 1850.00	.....	Chas. J. Carpenter
Trowbridge ,....	Canal to Ottawa	42	500	Old	2170	4350.00	4535.00	.....	Albert Prange

NOT COMPLETED

S. Division.....	E. Fulton to Wealthy	42	2637	Old	13003	\$24261.00	\$24861.00	\$ 24798.00	Albert Prange
Emma Ave.....	Lake Ave , south	20	563	1206	1315	5100.00	5290.00	3287.00	Chas. J. Carpenter
Stocking St.....	W. Bridge to Seventh	42	3067	5964	15116	30021.00	30846.00	29217.00	Leonard Schneider

GRADED, GRAVELED AND GUTTERS PAVED.—NOT COMPLETED.

STREETS	EXTENT	Width of Road way	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
			Length of Street	Length of Curb	No of Sq. Yards	Contract Price	Amount of Roll		
Sigsbee	S. Fuller to Ethel	26	1702	3523	.....	\$ 7970.00	\$ 8190.00	\$7207.00	Kloote & Vander Veen
N. Ionla	E Bridge to Fairbanks	30	1700	3339	.....	7645.00	7995.00	6642.00	Richard Pickett
Briggs Ave.....	Grandville to Sheridan Aves	26	564	1122	.....	2290.00	2465.00	1689.00	Fred Gilner
Hughart Ave....	Grandville to Sheridan Aves	26	564	1122	.....	2285.00	2460.00	1684.00	Fred Gilner
Shamrock Place .....	.....	24	1438	2850	.....	7792.00	8077.00	2645.00	Richard Pickett
Hope Ave.....	Fitzhugh to Carleton	26	1308	2532	.....	7473.00	7723.00	5253.00	Kloote & Vander Veen
Silas Ave	Lake to Hope.....	24	664	1318	.....	3545.00	3760.00	2502.00	Kloote & Vander Veen
Milton Ave.....	Silas to Carleton.....	24	432	910	.....	2340.00	2465.00	1511.00	Kloote & Vander Veen
J. Ball P'k Blvd	W. Bridge to John Ball Park....	{ 16 22	1291	4394	.....	7455.00	7780.00	2252.00	L C. Hilding
Allen's Court ...	Lake to Wealthy	18	412	858	.....	2100.00	.....	.....	Kloote & Vander Veen
Summer	W. Bridge to Shawmut	{ 26 38	1589	3206	.....	6838.00	.....	.....	Vander Veen & Mossell
Bemis Ave.....	Wealthy Ave. to Sherman	26	1254	2622	.....	6800.00	.....	.....	Kloote & Vander Veen
Logan	S. Fuller to Rural	26	2380	4712	.....	12636.00	.....	.....	Kloote & Vander Veen
CONCRETE									
Van Dine Court	E. Fulton, north.....	14	632	1308	1008	\$1794.00	\$1904.00	.....	Vander Veen & Mossell
SHEET ASPHALT (Re-surfacing)									
Ionla, north.....	Monroe to Fountain.....	38	876	Old	1570	\$2923.00	\$3022.00	.....	Barber Asphalt Pav. Co.
Jefferson Ave...	State to Cherry.....	36	639	Old	2390	4497.00	4597.00	.....	Barber Asphalt Pav. Co.



TURNER STREET SUBWAY

View Looking South

1

2

3

4

5

6

MILEAGE OF STREETS.

The mileage of streets in the City, and the length of each class of improvements are shown in the following table:

Graded and paved with sheet asphalt,.....	5.833
“ “ “ “ block asphalt on gravel.....	1.215
“ “ “ “ “ “ “ concrete.....	.230
“ “ “ “ brick on concrete.....	14.348
“ “ macadamized.....	6.272
“ “ paved with tar concrete.....	.341
“ “ “ “ cedar blocks on concrete.....	2.913
“ “ “ “ “ “ “ planks.....	.184
“ “ “ “ “ “ “ gravel.....	.628
“ “ “ “ Portland cement concrete.....	.824
“ “ “ “ cobble stones on gravel.....	.755
“ graveled and gutters paved with cobble stones.....	81.615
“ “ “ “ “ “ “ brick and concrete.....	33.697
“ and graveled.....	29.781
Unimproved.....	112.956
Total	291.592

ROAD ROLLERS.

Rolling with the steam rollers began April 17th 1906, and ended December 29th 1906.

The rollers have been given the customary overhauling during the winter, and should be in good condition for the season’s work.

The receipts and expenditures for the past year, with the detail expenditures for each roller, follows:

STATEMENT.

Balance in Fund April 1st 1906.....	\$ 3002.96
Receipts for fiscal year.....	8667.28
Total	6670.24

Disbursements:

Maintenance	\$ 2124.89
Operation	3589.67
	<u>\$ 5714.56</u>
Balance in fund March 31st 1907.....	\$ 955.68

KELLY No. 1 ROLLER.

Maintenance—	Labor-Shop.....	\$ 116.98
	Labor-Engineering.....	39.38
	Repair parts.....	78.78
	Miscellaneous.....	10.51
Operation—	Labor, running	669.57
	Labor-cleaning	33.25
	Coal.....	275.97
	Kindling	25.30
	Oil.....	12.63
	Waste	1.78
	Miscellaneous.....	7.26
	Total.....	<u>\$1271.41</u>

KELLY No. 2 ROLLER.

Maintenance—	Labor-Shop.....	\$ 8.13
	Labor-Engineering.....	1.00
	Repair parts.....	66.22
	Miscellaneous.....	21.31
Operation—	Labor-running.....	678.48
	Labor-cleaning.....	46.40
	Tools	3.90
	Coal.....	245.01
	Kindling	20.45
	Oil.....	12.98
	Waste	5.50
	Miscellaneous.....	6.80
	Total	<u>\$1116.18</u>

RUSSELL ROLLER.

Maintenance—	Labor-Shop.....	\$ 289.86
	Labor-Engineering.....	4.00
	Repair parts.....	297.36
	Miscellaneous.....	24 14

Operation--	Labor-running	532.49
	Labor-cleaning	85.70
	Tools .....	.27
	Coal	169.42
	Kindling ..	14.40
	Oil	9.80
	Waste	2.21
	Miscellaneous	4.58
Total		\$1881.23

No. 4 HEISLER ROLLER.

Maintenance--	Labor-Shop	\$ 136.22
	Labor-Engineering	7.02
	Repair parts	851.52
	Miscellaneous	27.57
Operation --	Labor-running	551.80
	Labor-cleaning	89.50
	Labor-miscellaneous	11.66
	Tools	1.80
	Coal	176.98
	Kindling	16.40
	Oil	11.45
	Waste	1.86
	Miscellaneous	16.27
Total		\$1850.05
Road roller-Miscellaneous		\$ 17.00
" " Express		2.40
" " Telephone .....		.60
		\$ 20.00
Road Roller-Stock		\$ 72.69

SEWERS.

Five year sewer bonds to the amount of \$100,000, and ten year West Side Ditch Sewer bonds to the amount of \$104,000 were issued during the year.

Work on the West Side Ditch Sewer has progressed slowly. The Sewer was completed to Fourth Street late in the fall. The contractors promise to push the work to completion during the coming year.

The contract for the South End Sewer System was awarded to Thomas J. Peter Co. for \$97800, work to be completed July 1st 1906. Work has not progressed as rapidly as desired, but it is expected better progress will be made this Spring. The Jackson Reinforced Concrete pipe is being used for sizes 24 inches and over. The completion of the sewer will be of great benefit to property in the south end. The main sewer is temporarily connected to the Hilton Street Sewer at Chicago Avenue. It is not probable that it will be necessary to extend the trunk sewer west for the next ten or fifteen years, but the date of such extension will depend somewhat on the growth of the section sewerred.

The Monroe and Fulton Street sewer enlargement and deepening was contracted for, the Parmley reinforced concret block being largely used. This will relieve a large amount of the trouble from flooded basements heretofore experienced.

The table following gives the sewers constructed and contracted for during the year:

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING MARCH 31, 1907.

The table following gives the kind and cost of sewers constructed during the year.

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTORS
		INCHES	LENGTH			Contract Price	Amount of roll	
			Vitrified pipe	Ordn. C.					Sanitary combined
Broadway W.....	Butterworth to Earle.....	9	...	212	....	\$327 00	\$427 00	James B. Hoey
Chatham.....	Gold to W. Broadway.....	9	...	304	....	220 00	306 00	John Rens
Dolbee ..	Sherman to Dunham.....	9	...	351	....	337 00	410 00	John Rens
Dunham.....	Dolbee to Finch.....	9 12	... ...	373 375	....	940 00	1100 00	John VanderWeele
Eighth Ave.....	Cass to Jefferson Ave.....	9	...	239	....	311 00	396 00	Peter DeWitt
Eighth Ave	Terrace to Madison Ave.....	9	...	240	...	575 00	325 00	Edward Fony
Forrest N.....	Quimby to Sweet.....	8 9 12	... ... ...	72 490 210	....	1008 00	1220 00	John VanEas
Fountain	N. East St. west.....	9	...	355	....	397 00	480 00	John Rens
Godfrey Ave.	Hall St. south	12	...	373	...	461 00	532 00	John VanderWeele
Hodgson Place.....	S. Lafayette St. west.....	8 9	... ...	100 430	....	748 00	861 00	Adrian DeWitt
Ionia N.....	Hastings to Fairbanks.....	...	...	...	...	659 00	793 00	John Rens
Ionia S.....	Prescott to Miller	8 9	... ...	167 610	....	859 00	981 00	VanEas & Fony
J. B. Park Boulevard.	W. Bridge to Cayuga	9	...	500	....	690 00	965 00	VanEas Bros.
Lafayette, S.....	Pleasant to Sycamore	15	...	505	...	1494 00	1894 00	Peter DeWitt

SEWERAGE CONSTRUCTED—Continued.

STREET	EXTENT	KINDS				Storm	Manholes	COST		CONTRACTOR
		INCHES	LENGTH	Sanitary Combined	Contract Price			Amount of Roll		
									Wrought Pipe		Cast Iron
Leonard, E. Alley..	Canal to N. Ionin	8 9	114 293			1	1	\$ 308 00	\$ 683 00	Adrian De Witt
Logan	S. Fuller to Rural	8 9 12	754 613 679			8	8	2220 00	2426 00	John Van Elms
Ninth	Davis St. west	8	185			1	1	340 00	898 00	Peter De Witt
Oakland Ave., Alley	Fifth Ave to B	8	710			3	3	805 00	1065 00	John Van Elms
Oakland Ave.. .	Fifth Ave south	8	126							
*Canal St	Soldiers' Home to City . .	10	6981			21	21	11252 00	11252 00	John Rens
Wellington Place	S. East to Buckeye. . . .	8 9	230 218			3	3	742 00	837 00	John Vander Weele
Williams	S. Commerce to Division .	9	219			1	1	447 00	527 00	Adrian De Witt
Valley Ave., S . .	W. Fulton to California.....	9	592			3	3	1023 00	1213 00	Fons & Vander Weele
Monroe	N. Division to E Fulton . .	30	345			6	6	10147 00	10147 00	Peter De Witt
*E Fulton	Monroe to Barclay	24 27 30 30	101 273 263 238							
S. Fuller.	Sherman to Fifth Ave	9 12 15	200 315 345			5	5			
Dunham	S Fuller west	9	414			2	2	3183 00	2426 00	John Rens

SEWERS CONSTRUCTED—Continued

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTOR
		INCHES	LENGTH			Contract Price	Amount of Bill	
		Victrol Pipe	Sanitary and Combined	Concrete				
Thomas . . .	S. Fuller, west . . .	9	300	..	1	..	..	..
Walbridge . .	Canal to Ottawa . . .	8	67	..	1	..	..	..
Canal . . .	Walbridge, north . .	8	190	..	1	..	..	..
Giddings Ave .	Wealthy to Sigbee . .	12	135	..	1	\$ 525	\$ 640 00	Jas. B. Hoey
Sigsbee . . .	Wealthy to Sigbee . .	12	323	..	339	..	..	..
..	S. Fuller to Ethel Ave . .	8	681	..	7	2390 00	2580 00	Peter De Witt
Wealthy Ave . .	Carleton Ave. to Allen's Co. rt.	12	645	..	..	..	..	..
..	..	..	..	..	387	..	..	..
Pleasant . . .	S. Lafayette to S. Union . . .	..	42	42	9	..	..	..
..	..	..	50	78	..	..	..	..
Union, S . . .	Pleasant to Sherman . . .	..	48	1250	..	13900 00	15900 00	Kloote & Vander Veen
Sherman . . .	S. Union to S. East . . .	..	60	621	..	..	..	..
..	..	..	48	638	5	..	..	..
Hope Ave . . .	Fitzhugh to Carleton Ave. . .	8	870	..	515	..	..	..
..
Silas Ave . . .	Hope Ave to Lake Ave . . .	8	600	..	450	..	..	..
..
Milton Ave . .	Silas Ave to Carleton Ave . .	8	350	..	2	2545 00	2925 00	Peter De Witt
Hurd Court . .	Silas Ave. to Carleton Ave . .	8	350	..	2	..	..	..

5.743 miles.)

SEWERS CONSTRUCTED—Continued.
SOUTH END SEWER SYSTEM.

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTOR
		LENGTH		SLOPE		Contract Price	Amount of Roll	
		Vitrified Pipe	8 in. and Combined					
Ninth Ave	Hilton to Buchanan		30	1081	5			
Walton	Ninth to Hall		27	1236	5			
Hall	Buchanan to Steele	8 13	24	247 407 190	5			
Steele	Hall to Stevens	8 9		538 641	4			
Chicago Ave	Hall to Stevens	20		1153	3			
Phillips	Hall to Stevens	8 9		632 232	3			
Stevens	Chicago Ave to Division		30	1061	6			
Division, W	Stevens to Crofton		30	1270	6			
Crofton Ave	Division to Jefferson Ave		30	905	3			
Jefferson Ave	Crofton to Huron	15 20	27 30	1346 689 1153 1308	13			
Clifton Ave	Jefferson Ave. to Buchanan	8 9 13		2331 301	7			
Davis Ave	Jefferson to Madison Ave		27	1308	3	\$ 17500 00	\$ 97000 00	Thos. J. Peter Co
Dickinson Ave	Jefferson to Madison Ave	8 9		1171	4			

SEWER CONSTRUCTION—Continued.
SOUTH END SEWER SYSTEM.

STREET	EXTENT	KINDS			Manholes	COST		CONTRACTOR
		INCHES	LENGTH			Contract Price	Amount of Roll	
			Vitrified Pipe	Sanitary and Combined				
Madison Ave	Davis to Griggs Ave	8	...	621	5	...	...	...
		10	...	387		...	...
		12	...	550		...	...
		15	...	381		...	...
		18	...	...		...	...
Francis Ave..	Griggs to Burton Ave.	8	...	1349	3	...	...	...
Horton Ave	Griggs to Burton Ave.	8	...	1350	3	...	...	...
Burton Ave.	Jefferson Ave to Div. Alley	15	...	266	4	...	...	...
		24	...	330		...	...
		30	...	341		...	...
Division, S.....	Griggs to Burton Aves	8	...	898	8	...	...	...
Division Alley	Quigley Alley to Burton Ave	9	...	336		...	...
		10	...	...		...	...
		12	...	140	...	...
Quigley Alley	Division Alley to Buchanan.	12	...	1155	2	...	...	...
Stewart Alley	Buchanan to Division....	8	...	1300	3	...	...	...
Buchanan.	Burton to Brown Aves.	8	...	...	5	...	...	...
		9	...	1365		...	...
Rose Alley.....	Division to Buchanan.	8	...	1206	2	...	...	...
Rose Street.....	Division to Buchanan.	8	...	1208	4	...	...	...
Elm Ave.....	Division to Buchanan.	8	...	1208	4	...	...	...

(7.456 Miles.)

The above noted sewer work will cost \$163157.00 and increase the system 13.2 miles.

The total mileage of sewers in the city is given below.

Combined.....	135.347
Seperate system	{ Sanitary..... 14.621
	{ Storm 13.277

Composed of the following:

Brick.....	22.186
Vitrified pipe.....	132.177
Cement pipe.....	.100
Wrought iron pipe .....	.160
Cast iron pipe .....	.224
Concrete sewer.....	8.034
Concrete-brick.....	.394
Total	163.245

In connection with this system there are 2810 man-holes.

FLOOD WORK.

Work on the river at the north end was continued on resolution of the Council passed May 28th 1906. Work was commenced June 2nd. The wall was continued south to near the north line of Crosby Street and connected with Front Street with a cutoff wall. The wall was also continued north to about three hundred feet north of Webster Street. This gave a total length of 1415 feet of main wall and 305 feet of cut-off wall.

The old Widdicomb siding embankment was built on top of the old slabs and sawdust from the saw-mill. The Widdicomb dike was built so late in the fall of 1904 that there was no time to properly examine and prepare the sub-grade. The flood of 1905 showed considerable

seepage at different points. To prevent future trouble, a trench was carried down through the river face of the embankment and the underlying refuse into the sandy clay forming the natural soil. In this was constructed an eighteen inch concrete core-wall. This wall is 1050 feet long and extends from the north end of the main wall north-westerly to near the Grand Trunk embankment. The old embankment was raised to an elevation of thirty-one feet city datum and given a top width of fifteen feet with two to one slopes on river side with one and one-half to one on land side. As there is practically no current adjacent to the embankment, the slopes will be seeded.

Rock excavation in the bed of the river was carried on only as the rock could be used in the Flood Work or sold to contractors. Stone has been furnished for concrete work on Indian Mill Creek and the piers and abutments of Ann Street Bridge. The detailed cost of the river work during the year follows:

	Equipment and Installation	Labor and Material
Grand River—North End—Itemized Expenditure,		
Superintendence and general expenses,	\$	2329.44
Engineering and transportation,		262.55
Cofferdams,		3897.45
Pumping,	\$ 193.03	2345.58
Quarrying Air Compressor,	66.43	933.80
" Drills & Piping,	28.06	1110.72
" Tools, Carts, etc.,	382.14	
" Cleaning,		1340.47
" Blasting,		1094.24
" Moving,		9026.73
Crushing -Crusher, Engine and Bins,	136.18	5945.40
Storage Stone crushed,		144.00
Wall Excavation,		4525.73
" —Concrete in place,	547.70	18106.37

Selling,.....	2477.19
Widdicomb Embankment and raising track,.....	2087.61
" Work,	527.15
Miscellaneous,	129.20
Watchman,	34.00
Derrick,.....	2719.10
	<hr/>
	\$ 4073.24 \$ 56307.81
	4073.24
	<hr/>
	\$ 60381.05

Concrete cars and track.

From the above should be deducted receipts for the sale of stone
\$11963.09

2459 82 other material sold and transferred to other work.

1149.52 accounts receivable.

\$15572 43 total, making the net cost of the work \$44808.62.

INDIAN MILL CREEK.

Work on Indian Mill Creek, other than the completion of the contract work previously started by Mr. Rusche, could not be started until late in the fall on account of the difficulty in securing the necessary agreements. Work was first started on building the north retaining wall adjacent to the Malleable Iron Works plant. This was carried on through the winter and is nearly completed from the east end of the Malleable Iron Works buildings west to the point where the creek now crosses under the Muskegon, Grand Rapids & Indiana Railway. At the latter point, abutments for the northern siding are completed and now await the construction of the trestle by the Grand Rapids & Indiana Railway. We also have completed the dam just above this trestle which is intended to retain the natural creek bed to the west.

The portion of the foundation in the neighborhood of Alpine Ave. was found to be very soft, making the construction of a pile foundation necessary. Considerable excavating has been done in connection with the work as far as the siding and other tracks would permit. The total cost of the work for the fiscal year is given below.

	Equipment and Installation.	Labor and Material.
Land and moving house,.....	\$	1300.00
Superintendence and general expense,.....		686.53
Engineering and transportation,		178.00
Sheathing trenches,.....		818.18
Pumping,.....	\$ 456.95	917.84
Walls and abutments—Excavation,.....		7824.87
“ “ “ —Concrete mixing	1204.70	8262.45
Watchman,.....		94.00
Miscellaneous,.....		1.38
Dam,		201.53
Rail,.....		107.00
Grade,.....		80.09
Piles,.....		1084.75
	\$ 1661.65	\$ 21551.62
		1661.65
		\$ 23213.27

From which should be deducted for material sold and transferred, \$1257.50, leaving the net cost \$21955.77.

Late in the fall arrangements were made with the Grand Trunk Railway for constructing their abutments over the creek near Broadway. The work was carried on in connection with the city's portion of the improvement and the abutments and retaining walls completed. One of the old spans from Bridge Street Bridge was used for the superstructure in connection with two new girders which it was necessary to purchase. The bridge

work has not been completed, owing to the difficulty which the Grand Rapids Railway Company have encountered in securing the necessary rails for their track system. The total cost of the work is given in the following table:

	Equipment and Installation.	Labor and Material.
Superintendence and general expense,.....	\$	786.55
Engineering and transportation,		113 30
Sheathing trenches,.....		55.26
Pumping,.....	\$ 51.20	552.09
Walls and Abutments—Excavation,.....		4531.69
“ “ “ —Concrete mixing,	230.50	5058.16
Watchman,.....		21.00
Main—Lowering,.....		274.16
Bridge,		1660.93
Rail,.....		1.75
	\$ 281.70	\$13054.89
		281.70
		\$ 13336.59

From which should be deducted \$250.75 for material transferred to other work. There also should be deducted the cost of the Grand Trunk Railway Company's portion of the improvement which was not completed in time to be definitely stated in this report.

Mr. Rusche completed the deepening of the creek between Broadway and the river and Turner Street bridge. A statement of the cost of this work paid during the fiscal year is given below:

	Indian Mill creek	Turner St. bridge	Total
Estimates.....	\$ 834 19	\$1024 85	\$1859 04
Material	1953 77	.....	1953 77
	\$2787 96	\$1024 85	\$3812 81

Practically all agreements for the completion of the work have been secured, with the exception of a written agreement from the Grand Rapids and Indiana Railroad, but this has verbally been so agreed to that there will probably be no further delay. The following table shows the total cost of the work and the funds appropriated for the current year:

RECEIPTS.

Appropriation Aug. 18, 1906 from general fund.....	\$ 50,000.00
“ Jan. 10, 1907 from contingent fund.....	25,000.00
“ March 30, 1907 from contingent fund.....	5,000.00
Grand river, north end—Stone.....	11,963.09
“ “ “ “ Material.....	2,459.82
Indian Mill creek, Alpine—Material.....	1,257.50
“ “ “ “ Broadway—Material	250.75
Disbursement from contingent fund from Apr. 1, 1906 to May 28, 1906	709.02
	<u>\$ 96,640.18</u>

EXPENDITURE.

Flood relief No. 1.....	\$ 1,992.11
Widdicomb embankment.....	2,087.61
Grand river, north end.....	58,293.44
Indian mill creek—Alpine.....	23,213.27
“ “ “ “ Broadway	13,336 59
Receipts in contingent fund for flood work from April 1, 1906 to May 28, 1906.....	2,731.89 101,654.91
Overdraft April 1st, 1907.....	\$ 5,014.73
Accounts Receivable April 1, 1907.....	1,149.52

In addition to the above construction work, the expense of assisting people flooded at the time of the overflow of Indian Mill Creek, the sand-bagging of Scribner street, and the operating of flood pumps at the time of high water in January, 1907, was paid from the flood work fund. The cost of this work amounted to \$1992.11.

In January, following the thaw and the succeeding freeze, the river became jammed with ice from Grand Haven to above the power dam, flooding considerable territory. Following a public mass meeting, the Common Council directed this department to clear the river of ice, commencing at Grand Haven. For this purpose \$3840.22 was spent as shown below. A boom was also placed across the river at Ann street bridge to hold the newly formed ice above that point. Also considerable money was spent clearing out the ice through the city as the channel opened. All this work was paid from the contingent fund and the total cost is given below:

Flood Relief No. 2—Work at Grand Haven, paid through the			
	Grand Haven bank.....		\$3588.18
"	"	—Work at Grand Haven, paid locally.....	807.01
"	"	—Work here in city	1088.53
"	"	—Boom at Ann street	975.54
"	"	—Breaking channel in ice here in city.....	254.80
			<hr/>
			\$6108.59
Credit, Axes.....			4.00
			<hr/>
			\$6099.59

A table is also given for the total cost of the work since the beginning:



NORTH LAFAYETTE STREET

Bituminous Macadam Pavement. Looking North Near Fulton Street.

COST OF FLOOD WORK SUMMARY.

DISBURSEMENT	Fiscal Year of 1904-05	Fiscal Year of 1905-06	Fiscal Year of 1906-07	TOTAL
Flood Relief, No 1.			\$ 1992 11	\$ 1992 11
Widdicomb Embankment	\$ 9882 13	\$ 4 00	2067 81	11974 34
Grand River—North End		28331 27	58298 44	86634 71
Indian Mill Creek—Alpine			23213 27	23213 27
Indian Mill Creek—Broadway			13336 50	13336 50
Indian Mill Creek—Contract		3005 33	2787 96	5793 29
Turner Street Bridge		5369 70	1024 85	6394 55
	\$ 9882 13	\$28710 90	\$102735 83	\$149328 86
Receipts and Credits		758 19	15631 16	16669 35
	\$ 9882 13	\$ 35052 71	\$ 85804 67	\$132639 51
Net Cost for Fiscal Year 1904-1905				\$ 9882 13
" " " 1905-1906				35052 71
" " " 1906-1907				85804 67
				\$132639 51
Accounts Receivable on hand April 1, 1907.				\$1149 52



COST OF FLOOD WORK—SUMMARY.

DISBURSEMENT	Fiscal Year of 1904-05	Fiscal Year of 1905-06	Fiscal Year of 1906-07	TOTAL
Flood Relief, No. 1.....			\$ 1992.11	\$ 1992.11
Widdicomb Embankment.....	\$ 9882.13	\$ 4.60	2087.61	11974.34
Grand River—North End		28331.27	58293.44	86624.71
Indian Mill Creek—Alpine			23213.27	23213.27
Indian Mill Creek—Broadway.....			13336.59	13336.59
Indian Mill Creek—Contract		3005.33	2787.96	5793.29
Turner Street Bridge.....		5369.70	1024.85	6394.55
	\$ 9882.13	\$36710.90	\$162735.83	\$149328.86
Receipts and Credits		758.19	15931.16	16689.35
	\$ 9882.13	\$ 35952.71	\$ 86804.67	\$132639.51
Net Cost for Fiscal Year 1904-1905.....				\$ 9882.13
" " " " " 1905-1906				35952.71
" " " " " 1906-1907				86804.67
				<u>\$132639.51</u>
Accounts Receivable on hand April 1, 1907.....				\$1149.52

TABULATION SHOWING GAGE READINGS.

From May 1, 1906, to April 30, 1907.

Day	1906						1907					
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	1.85	1.82	Sunday	.08	.47	.50	.70	1.95	.. ....	10.05	8.80	8.80
2	1.87	1.22	.25	.97	Sunday	.35	.55	Sunday	3.55	10.20	6.30	8.25
3	1.75	Sunday	.27	.35	Elect'n	.45	.60	1.40	4.05	Sunday	Sunday	7.65
4	1.85	.85	Fourth	.85	.45	.12	Sunday	1.00	4.35	9.80	6.75	8.60
5	1.80	1.17	.10	Sunday	.47	.10	.33	.60	4.25	9.50	6.80	5.30
6	Sunday	1.90	.10	.45	.50	.05	.27	.70	Sunday	9.30	6.40	4.45
7	1.85	1.30	.15	.35	.57	Sunday	.20	1.40	4.30	8.80	5.85	Sunday
8	1.45	1.20	Sunday	.10	.57	.05	.20	1.82	5.85	8.50	5.45	8.85
9	1.35	1.50	.10	.40	Sunday	.03	.17	Sunday	6.85	8.10	4.95	4.00
10	1.30	Sunday	.12	.60	.60	.00	.17	2.00	6.80	Sunday	Sunday	3.75
11	1.20	4.22	.15	.82	.57	.15	Sunday	2.15	7.00	7.55	3.80	3.05
12	1.15	4.95	.15	Sunday	.50	.10	.00	2.05	7.10	7.25	4.90	3.35
13	Sunday	4.75	.18	.47	.42	.20	.00	2.10	Sunday	6.90	6.55	3.30
14	1.95	4.30	.18	.37	.87	Sunday	.00	2.30	5.95	6.55	7.05	Sunday
15	1.85	3.15	Sunday	.08	.40	.20	.10	2.35	5.25	6.40	7.00	3.05

GAGE READINGS—Continued.

1906												1907				
Day	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Day			
16	2.35	2.65	.10	.10	Sunday	.27	.10	Sunday	4.75	6.15	8.05	3.10	16			
17	2.50	Sunday	.05	.10	.32	.27	.40	3.05	3.65	Sunday	Sunday	3.05	17			
18	2.30	1.65	.05	.22	.37	.30	Sunday	2.75	3.50	6.05	7.10	2.92	18			
19	1.80	1.60	.10	Sunday	.35	.25	.40	2.39	6.95	6.45	7.15	2.90	19			
20	Sunday	1.30	.15	.30	.30	.27	.60	1.95	Sunday	6.70	7.20	2.65	20			
21	1.44	1.25	.30	.28	.28	Sunday	.85	1.85	10.45	6.70	7.05	Sunday	21			
22	1.10	1.20	Sunday	.33	.22	.27	1.70	1.60	10.85	6.60	7.05	2.43	22			
23	.95	1.10	.85	.25	Sunday	.25	2.55	Sunday	13.45	6.20	6.75	2.32	23			
24	.80	Sunday	.35	.18	.05	.27	2.85	1.45	15.65	Sunday	Sunday	1.88	24			
25	.75	.62	.40	.27	.30	.15	Sunday	1.30	13.20	5.55	7.25	1.80	25			
26	.60	.70	.40	Sunday	.30	.05	2.75	1.05	12.00	5.15	8.15	1.77	26			
27	Sunday	.70	.37	.07	.35	.30	2.90	.80	10.55	4.55	8.60	1.90	27			
28	.75	.62	.40	.07	.35	Sunday	2.55	.85	10.25	3.90	8.65	Sunday	28			
29	1.05	.45	Sunday	.18	.17	.65	Thanks-giving	.45	10.20	.....	8.45	1.90	29		
30	Decora- tion day	.40	.08	.35	Sunday	.85	2.15	Sunday	10.20	.....	8.15	3.67	30		
31	1.25	.....	.03	.35	.....	.80	.....	2.05	10.20	.....	.....	.....	31

Computed May 22, 1907. E. H. V.

WATER WORKS.

Work the past year consisted largely in lowering mains and services, and laying new mains in streets being improved. Outside of this, a large fire main has been nearly completed in Alpine avenue, north from North street, and pipe for a 12-inch main connecting with this delivered on Broadway. The old main in Lyon street was replaced with 10-inch pipe from Canal street to the river. The 4-inch main in Erie street was also replaced with 10-inch from Canal to Mill street, and the two ends of Mill street were connected up with 10-inch pipe. Fuller street main was extended from Fifth avenue south to the new standpipe. A 20 inch main for the river crossing was laid from Front street to the river. Connection across the river has been delayed waiting the final decision on lowering the river bed opposite the pumping station.

The pipe during the past year was furnished by the American Car & Foundry Co. of Detroit, the valves by the Darling Pump & Mfg. Co. of Williamsport, Pa., and the hydrants by the R. D. Wood & Co., of Philadelphia. Seven and one-half foot hydrants have been used, as during the past two years.

As far as possible, the work has been done by contract, but on account of the large amount of work, no propositions have been received on a considerable number of the streets, with the result that it was necessary to take care of this by day labor.

The following table gives the list of water mains laid during the past year, and is followed by a table showing the mains lowered and the streets in which

WATER MAINS--Continued.

CITY OF GRAND RAPIDS, MICH.

55

STREET	EXTENT	Distance in feet from		DIAMETER IN INCHES							COST			
		E	W N. S	4	6	8	10	12	16	Material	Labor	Eng & Inc	Total	Removed
Island St	At Division	25	...	..	..	..	39	..	..	82 37	47 52	26 48	136 25	..
John Hall Park B	Bridge south	25	...	1345	..	..	..	..	..	663 40	483 85	3 00	1350 31	..
Lyon St	Cuna St west.	25	25	17	..	..	525	..	..	921 21	572 42	14 00	1507 63	..
Lane Ave	Jackson to Chatham..	30	..	..	..	324	..	..	..	220 26	171 27	1 60	393 13	..
W Leonard St.	Front to Scribner	25	..	..	..	24	..	258	..	318 17	271 27	1 15	593 50	..
Levellier St	Office to West	25	..	..	..	130	..	..	..	91 70	61 70	1 86	146 35	..
Milton Ave	Slas to Carleton	20	..	473	..	..	..	..	..	264 23	145 10	1 00	410 03	..
Myrtle St	At Scribner	25	..	..	..	66	..	..	..	50 00	56 53	73	106 16	..
Mill St.	E Canal and South	..	..	..	..	30	127	..	..	400 46	190 11	1 00	600 57	..
Maple St	At Division	..	..	..	..	42	..	..	..	38 76	37 17	20	76 13	..
Madison Ave	Griggs to Burton	25	..	..	..	1348	..	..	..	925 69	385 07	2 00	1323 96	..
Orchard Hill..	Present main south	25	..	..	..	522	..	..	..	390 37	190 08	1 00	582 35	..
Chakes St	At Division	25	..	..	..	41	..	..	..	57 07	46 64	28	106 19	..
Portsmouth Ter	Fountain to Fulton	8	..	..	..	759	..	..	..	497 52	385 29	7 00	889 51	..
River Crossing	.. .. .	..	..	..	..	..	..	..	..	348 16	322 17	7 05	677 38	..
Sigsbee St.	Fuller to Ethel	25	..	..	..	1814	..	..	..	1214 21	579 64	1 00	1794 88	..
Locking St.	Bridge to Seventh	25	..	..	..	..	..	..	..	114 06	37 00	2 05	153 11	..
North St.	At Scribner	25	..	..	..	74	..	..	..	55 90	62 23	80	118 93	..

WATER MAINS—Continued

STREET	EXTENT	Distance in feet from E | W | N | S Street Line		DIAMETER IN INCHES						COST			
				4	6	8	10	12	16	Material	Labor	Eng. & Inc.	Total	Removed
Scribner St.....	Bridge to Webster	31	.....	.....	.....	.....	.....	.....	\$ 656 72	\$ 196 00	\$ 5 60	\$ 858 32	.....
Silas Ave.	Hope to Lake	20	.....	.....	708	.....	.....	.....	417 68	229 40	2 00	649 08	.....
Shamrock Place.	Grandville East	30	.....	.....	1202	.....	.....	.....	829 95	415 10	5 00	1250 05	.....
Tenth St.	At Scribner.....	25	.....	.....	71	.....	.....	.....	54 03	80 03	78	114 84	.....
Third St.	At Scribner	25	.....	.....	64	.....	.....	.....	41 22	46 86	60	88 70	.....
Trowbridge St .	Clancy to Prospect.	25	.....	.....	653	.....	.....	.....	406 98	247 12	1 00	655 04	.....
Van Pine Court	Fulton, north	5	.....	.....	654	.....	.....	.....	480 51	226 26	2 50	709 40	.....
Valley Ave	W. Bridge to Jackson	25	.....	.....	12	601	.....	.....	555 55	271 07	2 30	828 92	.....
Webster St.....	At Scribner.....	23½	.....	.....	.....	.....	.....	.....	21 10	24 00	31	45 41	.....
									22553 30	11110 02	126 53	33796 85	

Total value of mains \$ 33796 85

Connections paid for by private parties 222 85

Total to go on inventory \$ 34019 00

LOWERING MAINS.

MAIN.	PLAN TITLE.	W	N.	■	0	6	12	Labor.	Misc. Material.	Engi- neering.	TOTAL.	Total Main- tenance
Division ..	Fulton to Wealthy	25	..	..	..	..	75	\$ 66 37	..	\$ 18	\$ 66 55	.....
Scribner ..	Bridge to Webster	21	..	..	573	..	..	527 60	\$13 07	3 08	544 35	.....
Bridge ..	Jefferson to Garfield	25	..	..	1176	..	..	544 07	41 73	11 70	597 49	.....
Lincoln ..	" " "	25	..	96	..	..	..	12 02	.53	.84	13 19	.....
Barker ..	" " "	30	..	314	..	..	..	15 02	1 15	.31	16 48	.....
Marion ..	" " "	25	..	..	28	..	..	10 17	.78	.21	11 15	.....
Fremont ..	" " "	25	..	..	..	46	..	21 30	1 63	.45	23 38	.....
Straight ..	" " "	20	..	..	844	..	..	39 60	3 00	.84	43 94	.....
Stooking ..	Bridge to Seventh	25	..	..	235	..	..	73 33	..	.98	73 80	.....
Adams	Madison to Paris	25	..	10144	..	..	..	..	..	..	302 90	.....
Canal	Leonard to Dean	25	..	..	..	1940	..	679 95	5 42	4 04	689 99	.....
											\$2283 22	\$2283 23

LOWERING SERVICES, ETC.

MAIN.	PLAN TITLE.	6		Labor.	Misc. Material.	Engineer's	TOTAL.	Total Main- ten- ance
		Lineal Feet.						
Scribner	Bridge to Wehster.....	2092.5		\$1752.86	\$38.12	\$12.17	\$1803.15	.....
Bridge	Jefferson to Garfield.....	924		491.60	32.79	9.16	533.55	.....
Stocking	Bridge to Seventh.....	917		337.74	.....	3.87	341.61	.....
Adams	Madison to Paris.....	.....		.....	.....	.....	27.00	.....
Canal.....	Leonard to Dean.....	105		60.82	.34	.30	61.46	.....
W. Leonard.....	Front to Scribner .....	.....		3.71	.....	.....	3.71	.....
General .....	.....	.....		15.56	.....	.....	15.56	.....
							<u>\$2786.04</u>	<u>\$2786.04</u>
								<u>\$5068.26</u>

MILES.

	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	24 in.	30 in.	36 in.	Hy- drants	Valves
Prior to 1906	40.548	61.638	21.065	8.219	16.158	.239	8.297	.749	1.959	1.927	.585	.019	1533	1560
Laid in 1906 .....	.....	2.759	.238	.191	1.022	.....	.155	.....	.059	.....	.....	.....	41	96
Totals	40.548	64.397	21.303	8.410	17.180	2.39	8.453	.749	2.018	1.927	.585	.019	1574	1656
Removed .....	.144	.054	.127	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	40.404	64.343	21.176	8.410	17.180	.239	8.453	.749	2.018	1.927	.585	.019	1574	1656

Total Miles of Pipe—165.502.

During the year a contract was let to Mr. Joseph Rusche for the construction of the concrete connected with the standpipe. The contract for the steel work was awarded to the Rodgers Boiler and Burner Company of Muskegon.

Mr. Rusche completed the sub-structure ready for the steel work late in the summer, making it impossible for the contractor for the steel work to complete the tank before cold weather.

At the close of the municipal year, the steel tank was riveted and calked ready for testing, tightening and painting. The casing tower will be completed early in the coming year.

The cost of the work on the standpipe up to date is shown as follows :

TOTAL COST OF STANDPIPE MARCH 31, 1907.

For year ending May 1, 1904—

Land.....	\$498 65
Taxes.....	5 02

\$503 67

For year ending March 31, 1906—

Engineering.....	87 00
Printing.....	27 26
Blue Prints.....	94
Traveling Expenses.....	70 25
Telephones.....	75
Advertising.....	86 15

272 35

For year ending March 31, 1907—

Land.....	250 00	
Substructure.....	10534 00	
Superstructure.....	7240 00	
Connection.....	676 73	
Miscellaneous Material..	176 77	
Engineering and Incidentals.....	368 57	
		19246 07
Total		\$20022 09

The total receipts and distribution in connection with the extension fund is shown as follows :

STATEMENT.

Total disbursements.....	\$ 66860 38	
Stock on hand	5902 57	
	\$ 60957 81	
Material sold.....	2844 63	
Water Mains, Maintenance, etc.....	\$ 58113 18	\$ 58113 18
Water Main Inventory.....	\$ 33576 00	
Private work.....	222 85	
	33798 85	33798 85
Maintenance.....	5068 26	
Total Mains, Maintenance, etc.....	38867 11	
Standpipe.....	19246 07	
	58113 18	58113 18

WATER WORKS INVENTORY.

The inventory based on the same methods employed in last year's report has been prepared for the water works construction, and is herewith attached :

INVENTORY OF WATER MAINS 1906.

1 Year	2 COST		4 Remaining	5 %	6 Life in years	7 Cost at beginning of year	8 Yearly deposit (4) x (7)	9 Age in years	10 B' for \$1.00 compound d n years	11 Total depreciation (8) x (10)	12 Remaining value (1) (11)
	Original	Removed									
1873	\$ 33001 07	\$ 326 89	\$ 32694 18	3%	100	\$ 443 37	\$ 73 74	23	631 61	\$3805 73	\$ 28886 46
1874	110678 09	88460 20	22415 49	"	"	"	50 55	32	49 33	2493 18	19020 36
1875	43289 09	34444 41	18865 58	"	"	"	40 79	31	47 15	1983 35	16183 23
1876	36458 83	.....	25186 83	"	"	"	67 42	30	45 00	2563 90	22674 83
1877	.....	.....	.....	"	"	"	.....	29	.....	.....	.....
1878	.....	.....	.....	"	"	"	.....	28	.....	.....	.....
1879	53 50	.....	53 50	"	"	"	13	27	38 86	4 86	48 84
1880	7303 23	7303 23	.....	"	"	"	.....	26	.....	.....	.....
1881	37304 54	2425 76	34878 78	"	"	"	56 09	25	35 01	1903 71	22905 07
1882	519 77	.....	519 77	"	"	"	1 17	24	23 15	38 79	480 08
1883	10014 87	.....	10014 87	"	"	"	22 56	23	31 35	707 86	9306 99
1884	3033 06	284 55	2748 51	"	"	"	7 31	22	29 66	216 23	3023 30
1885	12878 77	968 61	11910 16	"	"	"	39 04	21	27 86	1087 65	10822 51
1886	16133 84	385 77	15748 07	"	"	"	35 56	20	26 18	1430 96	14337 11
1887	39453 76	.....	39453 76	"	"	"	66 43	19	24 54	1630 19	27823 37
1888	123113 38	4544 76	117568 62	"	"	"	265 17	18	23 95	6065 65	111423 63
1889	116601 62	1127 00	115474 62	"	"	"	280 45	17	21 39	5671 03	109803 59
1890	10618 70	877 33	9739 37	"	"	"	81 79	16	19 86	432 75	9306 62
1891	104440 58	656 55	103784 03	"	"	"	324 08	15	18 38	4302 39	99481 64

INVENTORY OF MACHINERY—Continued.

Year	1		2		4	5	6	7	8	9	10	11	12	REMARKS
	Original	Removed	Remaining											
1902	\$ 3500 00	.....	\$ 3500 00	3¼	30	53 43	\$65 51	4	\$4 36	\$ 285 62	\$ 3214 38	.....	
1903	1257 61	.....	1257 61	"	"	"	23 53	3	3 23	75 77	1181 84	.....	
1903	3616 00	.....	3616 00	"	"	"	67 67	3	3 23	217 90	3398 10	.....	
1904	143 25	.....	143 25	"	"	"	2 68	2	2 11	5 65	137 60	.....	
1905	2649 31	.....	2649 31	"	"	"	49 58	1	1 03	51 07	2598 24	.....	
	\$207120 01	\$ 31433 99	\$175686 02							\$75921 98	\$99764 04			

(4) equals (11) plus (12)

\$ 75921 98

99764 04

\$175686 02



QUIGLEY AVENUE

Portland Cement Concrete Pavement. With Park Along Center.
Looking West from Division Street.

INVENTORY OF MACHINERY—Continued.

1 Year	2 COST.		4 Remaining	5 %	6 Life in	7 \$ for \$1.00 compound'd in years	8 Yearly Deposit (4) x (7)	9 Age in	10 \$ for \$1.00 compound'd in years	11 Total depreciation (8) x (10)	12 Remaining value (4) - (11)	REMARKS
	Original	Removed										
1902	\$ 3500 00	.. .. .	\$ 3600 00	3%	30	53 48	865 51	1	84 36	\$ 285 62	\$ 3214 38	.....
1903	1257 61	.. .. .	1257 61	"	"	"	23 53	2	3 29	75 77	1181 84	.. .. .
1903	3616 00	.. .. .	3616 00	"	"	"	67 67	3	3 22	217 90	3398 10	.....
1904	143 25	.. .. .	143 25	"	"	"	2 68	2	2 11	5 85	137 40	.....
1905	2649 21	.. .. .	2649 21	"	"	"	49 58	1	1 02	51 07	2598 24	.....
	\$207180 01	\$ 31433 99	\$175646 02							\$75921 98	\$9764 04	

(4) equals (11) plus (12)

\$ 75921 98

\$9764 04

\$175646 02



QUIGLEY AVENUE

Portland Cement Concrete Pavement. With Park Along Center.
Looking West from Division Street.

INVENTORY OF PUMPING STATION, 1906.

1 Year	COST					6 %	7 Life	8 S for \$1.00 compounded n years	9 Yearly deposit (5)--(8)	10 Age	11 S' for \$1.00 compounded n' years	12 Total depreciation (9) x (11)	13 Remaining value (5)--(12)
	ORIGINAL COST			Removed	Remaining								
	Land	Structural											
1874	\$5000 00				\$ 5000 00								\$ 5000 00
1874		\$22492 70		\$261 39	22231 31	3	50	\$116 18	\$191 35	32	\$54 08	\$10848 21	11883 10
1875			1839 11	20 00	1819 11	"	"	"	15 65	31	51 50	805 98	1013 13
1876			1164 58		1164 58	"	"	"	10 03	30	49 00	491 47	673 11
1877			70 95		70 95	"	"	"	61	29	46 57	28 41	42 54
1878			82 50		82 50	"	"	"	71	28	44 23	31 40	51 10
1879			497 44		497 44	"	"	"	4 28	27	41 98	179 46	317 98
1880			39 79		39 79	"	"	"	34	26	39 71	13 50	26 29
1881			21 12		21 12	"	"	"	18	25	37 55	6 76	14 26
1885			136 25		136 25	"	"	"	1 17	21	29 54	34 56	101 69
1888			2907 62		2907 62	"	"	"	25 03	18	24 12	608 48	2304 14
1889			516 89		516 89	"	"	"	4 44	17	22 41	99 50	417 39
1890			98 05		98 05	"	"	"	80	16	20 76	16 61	76 44
1891			5292 24		5292 24	"	"	"	45 55	15	19 16	872 74	4419 50
1892			16586 19		16586 19	"	"	"	142 76	14	17 60	2512 58	14073 61
1893			10738 52		10738 52	"	"	"	92 43	13	16 09	1487 20	9251 32
1894			489 75		489 75	"	"	"	4 22	12	14 62	61 70	428 05

INVENTORY OF PUMPING STATION—Continued.

1	2	3	4	5	6	7	8	9	10	11	12	13
Year	COST			Remaining	%	Life	S for \$1.00 compounded n years	Yearly deposit (5) -- (8)	Age	S for \$1.00 compounded n years	Total depreciation (9) x (11)	Remaining value (5) -- (12)
	Land	Structural	Removed									
1845	.....	\$ 548 99	.....	\$ 548 99	3	50	\$110 18	\$ 4 90	11	\$13 19	\$ 64 63	\$ 504 36
1847	.....	1173 76	.....	1173 76	"	"	"	10 10	9	10 48	105 65	1068 11
1890	.....	16 46	.....	16 46	"	"	"	14	7	7 89	1 10	15 36
1900	.....	357 05	.....	357 05	"	"	"	3 07	6	6 65	20 45	338 60
1905	.....	133 30	.....	133 30	"	"	"	1 14	1	1 02	1 16	132 14
	\$5000 00	\$45218 96	\$381 39	\$60638 87							\$17796 55	\$63150 32
	Total	\$70218 96										

Check \$17796 55
\$3150 32
\$60638 87

CONDUITS FOR CITY WIRES.

About \$8000 has been expended during the year for constructing conduits and placing underground city wires in the conduit district.

The conduits in West Bridge street and South Division street were laid in advance of the improvement. Those in South Division street, East Fulton street, and West Fulton street were laid in common with the Grand Rapids Edison company.

The North Ionia Alley conduits connect the City Hall with the Crescent avenue conduit. Police headquarters and No. 4 engine house also have been connected with the Crescent avenue conduits.

The following gives receipts and expenditures of the Conduit fund the past year, and the number of ducts owned by each company :

STATEMENT OF CONDUIT FUND, MARCH 31, 1907.

	Receipts	Disbursements	Edison Co. Share Paid	Edison Co. Share Owed	No. of City Ducts	No. of Edison Co. Ducts
Balance in Fund March 31, 1906	\$ 2649 56					
Budget Allowance, July 28, 1906	3000 00					
Budget Allowance, August 18, 1906	5000 00					
Temporary Loan from Contingent Fund, June 14, 1906	2000 00					
Return of Loan to Conting't Fund, Sept. 25, 1906		\$2000 00				
West Bridge Street	308 23	4322 64			6	0
East Bridge Street	244 55	628 76			9	0
South Division Street (City share)	74 23	1281 27			6	
South Division Street (Edison Co. share)		1147 31		\$1147 31		6
Crescent Ave. (City share)	113 56	867 60			6	
Crescent Ave. (Edison Co. share)	473 96	473 96	\$ 473 96			3
Eric Street	11 23	433 40			3	0
North Ionis Alley	4 67	280 83			4	0
North Division Street (City share)	301 49	190 58			12	
North Division Street (Edison Co. share)	1339 78	1339 78	1339 78			8
East Fulton Street (City share)	23 20	380 03			8	
East Fulton Street (Edison Co. share)		542 67		542 67		8
West Fulton Street (City share)	51 40	500 83			8	

BRIDGES.

Bridge maintenance work consisted in minor repairs to sidewalks on Leonard street, cleaning and painting the ironwork above floors of Sixth street, Bridge street, Canals and Fulton street bridges, planking the east span of Pearl street bridge, replacing portions of the concrete railing on Bridge street bridge, and placing concrete walks on Pearl street bridge over the west canal. Seats were also placed on Bridge street bridge.

The contract for fender piers for the Wealthy avenue bridge was awarded to Burk, Smith & Nelson, February 19, 1906, and the work was completed early in the year.

The east approach to the Wealthy avenue bridge was graveled and provided with drainage. No work has been done on the west approach, awaiting the decision on flood plans. Considerable expense was incurred in swinging the bridge, and some bridge plank were purchased for stock.

A statement of the expense incurred in the above follows :

BRIDGES FOR FISCAL YEAR OF 1906-7.			
Bridge Street Bridge—Railing.....	\$	271	56
“ “ “ —Engineering.....		2	00
“ “ “ —Car Fare.....		30	
			\$ 273 86
Bridge Street Bridge Seats—Inspection.....		53	
“ “ “ “ —Labor.....		1	13
“ “ “ “ —Seats.....		14	50
			16 16
Total disbursement for year.....	\$	290	02

WEALTHY AVENUE BRIDGE FUND.

Wealthy Avenue Bridge—Pier Fenders—Estimates....				\$ 4800 00
"	"	"	—Engineering..	12 00
"	"	"	—Inspection...	36 00
"	"	"	—Boots.....	3 50
"	"	"	—Advertising..	7 56
"	"	"	—Car fare.....	1 55
"	"	"	—Miscellaneous	10
				<hr/>
				\$ 4360 71
"	"	"	Swinging Draw Span.....	672 04
"	"	"	Arch.....	23 25
"	"	"	Anchoring West Abutment.....	10 00
				<hr/>
Total Disbursements for year.....				\$ 5066 00

WEALTHY AVENUE BRIDGE APPROACHES.

Wealthy Avenue Bridge Approaches—Labor.....				\$ 185 69
"	"	"	—Rolling.....	18 00
"	"	"	—Crushed Stone..	84 95
"	"	"	—Brick, etc.....	4 50
"	"	"	—Cedar Blocks...	60
"	"	"	—Gravel.....	123 30
"	"	"	—Band Iron.....	11 59
"	"	"	—Advertising	15
"	"	"	—Filling.....	2 60
				<hr/>
				\$ 431 38
Wealthy Avenue Bridge—Arch.....				2 80
"	"	"	—Swinging Draw Span.....	20 75
Taking Inventory				2 00
Stock				43 45
				<hr/>
				\$ 69 00
Leonard Street Bridge—Labor				\$ 1 79
"	"	"	—Engineering.....	2 00
"	"	"	—Advertising	15
				<hr/>
				\$ 3 94

Sixth Street Bridge—Labor.....	\$ 442 74	
“ “ “ —Paint	76 89	
“ “ “ —Naphtha.....	7 89	
“ “ “ —Miscellaneous.....	53	
“ “ “ —Lumber.....	2 59	
“ “ “ —Cartage.....	25	
“ “ “ —Tools.....	3 76	
“ “ “ —Waste	1 28	
“ “ “ —Phone.....	40	
	<hr/>	\$ 536 24
E. Bridge Street Canal Bridge—Labor	\$ 10 66	
“ “ “ “ “ —Paint.....	3 41	
“ “ “ “ “ —Phone	10	
	<hr/>	\$ 14 17
W. Bridge Street Canal Bridge—Labor.....	\$ 21 76	
“ “ “ “ “ —Paint.....	4 89	
“ “ “ “ “ —Phone	10	
	<hr/>	\$ 26 75
Fulton Street Bridge—Labor	\$ 341 68	
“ “ “ —Naphtha.....	3 15	
“ “ “ —Nails.....	54	
“ “ “ —Engineering.....	3 00	
“ “ “ —Tools	28 81	
“ “ “ —Paint.....	10 88	
“ “ “ —Phone	40	
	<hr/>	\$ 388 46
Pearl Street Bridge—Labor.....	\$ 34 52	
“ “ “ —Hardware.....	6 77	
“ “ “ —Engineering.....	5 00	
“ “ “ —Paint.....	10 88	
“ “ “ —Manhole Covers.....	6 00	
“ “ “ —Railing and Posts.....	12 51	
	<hr/>	\$ 75 68
Sidewalk for Pearl St. Bridge Approach—Advertising..	\$ 6 35	
“ “ “ “ “ “ —Inspection...	1 75	
“ “ “ “ “ “ —Engineering.	7 00	
“ “ “ “ “ “ —Car Fare....	20	
“ “ “ “ “ “ —Estimate....	340 00	
	<hr/>	\$ 355 30
Total disbursement from the bridge fund for the fiscal year of 1906-1907.....		\$ 1800 92

CREDITS.

Pearl Street Bridge, Lumber.....	\$	5	00
Sixth Street Bridge, Labor		53	
Leonard Street Bridge, Washers.....		1	43
Stock, Wealthy Avenue Bridge		51	34
Total receipts		58	30
			<u>\$ 1842 62</u>

ANN STREET BRIDGE.

At the spring election the issuing of \$66,000 of bridge bonds was authorized. Steps were at once taken to secure the necessary right of way, plans for piers and abutments were prepared and contract awarded to the Grand Rapids Bridge Company for \$20,000. Work was started late in the fall, but on account of high water only about one-third of the work was completed,

Contract for filling the east approach was awarded to Albert Prange, and the west approach is about one-half filled by dirt purchased by the load and material excavated from Indian Mill Creek work. Plans and specifications for the superstructure are nearly completed ready for advertising.

The receipts and expenses to date are shown below :

ANN STREET BRIDGE FUND.

FOR FISCAL YEAR OF 1906-'07.

Receipts—

Temporary loan from General Fund Sept. 13, '06.....	\$	500	00
“ “ “ “ “ Dec. 20, '06.....		5000	00
Sale of Bonds		67539	80
Uncalled for checks for labor, returned to fund.....		7	00
Transfer for Engineering		1	00
			<u>\$73047 80</u>
Disbursement, as specified below.....	\$	12184	67
Return of temporary loans to General Fund 3-30-'07.		5500	00
			<u>17684 67</u>
Balance March 31, '07.....			<u>\$55363 13</u>

DETAIL DISBURSEMENT.

ANN STREET BRIDGE—PIERS AND ABUTMENTS.

Estimates	\$ 6375 00
Engineering.....	157 00
Inspection	60 50
Crushed stone	917 91
Abstract for land.....	22 55
Driving sounders.....	41 00
Printing	12 65
Car fare	10 20
Advertising	101 51
	<hr/>
	\$ 7698 82

ANN STREET BRIDGE—WEST APPROACH.

Labor.....	\$ 2394 04
Material (dirt, cinders, etc.).....	1947 40
Fence	58 50
Printing.....	41 40
Tools.....	95
Advertising	12 31
Miscellaneous.....	20
	<hr/>
	\$ 4454 80

ANN STREET BRIDGE—SUPERSTRUCTURE.

Engineering	\$ 31 00
Car fare.....	55
	<hr/>
	31 55
	<hr/>
	\$12184 67

A reinforced concrete bridge over Indian Mill Creek at Turner street, and a steel truss and girder bridge over the same creek at Broadway were built as part of the flood protection work. The expense connected with this work is shown under Flood Work.

The following table gives an inventory of city bridges:

INVENTORY OF BRIDGES, 1904.

1	2		3	4	5	6	7	8	9	10	11	12	REMARKS
	Location	Portion											
			When Built	Original Cost	%	Life	B for \$100 compound in years	Yearly Deposit (4) - (7)	Age	S for \$100 compound in years	Total depreciation (6) x (10)	Remaining value (4) - (11)	
	Leonard Street...	Run. Abutments and Girders	1879	\$13190 00	3 1/4	35	\$98 00	\$191 15	37	45 25	\$6537 18	\$ 4539 83	.....
	Fulton Street	Masonry	1883	19911 00	3	40	77 66	356 38	33	33 43	8570 78	11340 23	.....
	Fulton Street ..	Superstructure	1883	30946 00	3	40	77 66	399 73	33	33 43	9017 07	11930 93	.....
	Pearl St. over river	Substructure	1885	11864 00	3	40	77 66	153 15	31	36 54	4534 05	7399 95	.....
	Pearl St. over river	Superstructure	1885	30480 00	3	40	77 66	303 71	31	36 54	7769 99	19030 01	.....
	Pearl St. over West Canal	Substructure	1886	4315 00	3	40	77 66	54 37	30	37 68	1503 19	3713 81	.....
	Pearl St. over West Canal ..	Superstructure	1886	5796 00	3	40	77 66	48 90	30	37 68	1333 55	3444 45	.....
	Sixth Street ..	Substructure	1886	7963 00	3	40	77 66	103 53	30	37 68	2638 08	5194 97	.....
	Sixth Street	Superstructure	1886	30361 00	3	40	77 66	361 15	30	37 68	7268 63	13093 37	.....
	Bridge St. over W. Canal	Old Abutments	1883	1000 00	3	40	77 66	19 37	33	33 43	430 34	560 76	.....
	Bridge St. over W. Canal	New Abutments	1901	2970 00	3	50	116 13	20 39	5	5 47	111 53	2858 47	.....
	Bridge St. over W. Canal	Cylinder Piers	1901	500 00	3	50	116 13	4 30	5	5 47	35 32	476 48	.....
	Bridge St. over W. Canal	Old Girders	1887	7000 00	3	40	77 66	90 13	19	25 37	3331 66	4668 34	.....
	Bridge St. over W. Canal	New Girders	1901	1610 00	3	40	77 66	30 60	5	5 47	112 63	1467 33	.....

INVENTORY OF BRIDGES, 1906—Continued.

1	2		3	4	5	6	7	8	9	10	11	12	REMARKS
	Location	Portion											
	BRIDGES												
	Bridge St. over W Canal	Roadway	1901	1000 00	3 1/4	30	39 36	54 88	5	5 55	333 47	1286 53	.....
	Bridge St. over E. Canal	} Substructure } Superstructure . . .	1901	31000 00	2 1/4	80	364 80	63 48	5	5 39	444 57	30555 43	.....
	Bridge Street over River . . . . .	. . . . .	1903	100000 00	3 1/4	80	254 80	333 95	3	3 15	1240 94	99359 06	.....
	Wealthy Ave. Main Substructure . . . . .	. . . . .	1904	25297 00	3 1/4	80	254 80	60 35	3	3 08	203 65	25290 35	.....
	Wealthy Ave. Main Superstructure . . . . .	. . . . .	1905	38008 00	3	40	77 86	497 14	1	1 03	512 05	38095 95	.....
	Wealthy Ave. Arch . . . . .	. . . . .	1905	16673 00	2 1/4	80	254 80	66 65	1	1 02	67 99	16604 01	.....
	Bridge Street	In Stock	1883	6000 00	3	40	77 86	64 38	23	33 43	2153 23	2347 78	.....
				\$34927 00							\$59418 99	\$234508 01	

(4) - (11) + (12) Check \$ 59418 99
 284508 01
 \$34927 00

CONTAGIOUS DISEASE HOSPITAL.

Last year estimates were made at the request of the Health Department for a contagious disease hospital, to consist of a central administration building that may also be used for the nurses when not on duty, and two large wards. The estimates were somewhere about \$60,000. Seven thousand dollars was appropriated for one building to be used at this time for contagious diseases. This amount was not sufficient, and \$3,000 was afterwards appropriated from the general fund. Up to date this has not been transferred.

The contract was let so late in the season that the contractor had difficulty in securing the necessary material to complete the building. The foundations were completed and the framework erected and inclosed. The heating and lighting and plumbing is being installed, and the remainder of the work should be completed early in the year.

As the city water mains do not come within some distance of the site, it was necessary to install an elevated water tank for water and fire protection and sink a well about 100 feet. A small electric pumping plant is being installed. A statement as to the expense of the work to date is given below :

BUILDING.

Estimates	\$ 3583 00
Engineering.....	232 00
Inspection.....	159 60
Advertising	13 32
Plans.....	185 80
Car fare.....	1 90
Pipe and fitting.....	24 00
	————— \$4199 62

WATER TANK.

Tank	\$ 180 00
Labor	222 75
Lumber	29 26
Inspection	28 70
Cartage	17 80
Cement	23 75
	<hr/>
	\$ 502 26

PLUMBING.

Estimate	\$ 1275 00
Advertising	12 32
	<hr/>
	\$ 1287 32

WELL.

Final Estimate	\$ 134 73
	<hr/>
	\$ 134 73
	<hr/>
	\$ 6123 93

FUND ACCOUNT.

\$ 7000 00 Appropriation.

6123 93 Disbursement.

\$ 876 07 Balance in fund March 31, 1907.

OPENING OF STREETS.

The methods of the preceding year have been followed during the past year in the issuing of permits for opening of streets. There were issued during the year permits to the number of 1,697, divided as follows :

Sewer connections	232
Water connections	512
Sewer and water connections	619
Miscellaneous repairs	329
Canceled	5
	<hr/>
Total	1697
Total number of permits issued last year	1425
Net gain over last year	272
Per cent gain	18

The street opening fund has been used as a temporary fund for various miscellaneous work, transfers later being made when the work was completed. The department has been handicapped by not having a storage yard and tool house located near the pumping station where the storekeeper for the water works department can take care of the supplies. As now located, considerable material is taken by parties without our knowledge, and the tool house has been frequently broken open and tools and equipment removed.

A statement of the street opening fund for the fiscal year is hereto attached :

**CONDITION OF THE STREET OPENING FUND FOR FISCAL
YEAR ENDING MARCH 31, 1907.**

Balance in fund March 31, 1906	\$	1151	64
RECEIPTS—PERMITS {			
Rolling		758	00
Inspection		1421	10
Repairs		2746	72
Rolling		208	00
Inspection		10	16
Sale of scrap iron		26	94
" " brick		21	25
Old street opening receipt		5	15
Sidewalk and nuisance roll		67	12
Miscellaneous		40	
			<hr/>
		\$	6416 48
DISBURSEMENT—REPAIRS {			
Labor	\$	667	26
Material		615	49
Rolling		555	22
Inspection—work		977	40
—Street		465	21
Stock		186	76
Old street opening		97	96
Miscellaneous labor (picking up scrap iron, etc.)		14	46
Printing		18	25

Book.....	1 25
Car fare	57 30
Livery	7 50
Corporation inspection.....	471 15
" work	252 87
Sidewalk repair.....	46 75
Transfers	1525 27
Envelopes	6 75
Special repair (Alabama street).....	7 50
Tools.....	1 00
Telegrams	25
Macadam repair.....	100 98
Engineering	6 00
Miscellaneous.....	79
	<hr/>
	\$ 6083 37
Balance in fund March 31, 1907.....	\$ 338 11
Accounts receivable on hand March 31, 1907.....	\$ 609 14

Payments made on work under charge of this department the past year are divided as follows:

Allen street tailrace	\$ 62 81
" " street repair	4 28
" B " street steps.....	196 24
W. Bridge street repair.....	105 62
Dock line	22 85
Fence around reservoir	1056 85
Flood gates—Front and Blumrich.....	418 25
" " —west side ditch	102 72
" surveys	14 62
East Fulton street culvert	264 98
Improvements	265291 82
Sewers	129759 85
South Ionia street repair.....	55 83
Mason street sewer extension.....	130 26
Street signs.....	28 44
Silver creek wall... ..	637 08
Walbridge street sewer extension.....	98 02
Waste paper cans.....	12 25
Wiring City Hall.....	1197 00

Ann street bridge.....	12184 67
Bridge street bridge... ..	290 02
Wealthy avenue bridge.....	5066 00
Bridges repairs.....	1900 92
Contagious disease hospital	6123 93
Conduits	12968 65
Flood relief No. 2.....	6099 59
Flood work, Grand river, North end.....	62373 16
“ “ Alpine	23213 27
“ “ Broadway.....	13336 59
Grandville avenue regrading	10 10
Hall and Godfrey catch basin	20 02
Indian Mill Creek contract.....	2787 96
Road rollers.....	5714 56
Street opening.....	6083 37
Turner street bridge.....	1024 85
Extra on Van Dine court improvement.	63 49
Allowances on water main contracts	23947 06
Total.....	\$ 582656 93

The following table shows the detailed office expense of the department for the year :

SALARIES—

Chargeable to general fund.....	\$ 11051 64
“ “ streets and sewers.....	3444 00
“ “ water works.....	1386 00
“ “ bridges.....	341 00
“ “ sundry funds	1425 00
	<u>\$17647 64</u>

SUPPLIES—

Office, postage and express.....	\$ 174 85
Library.....	41 00
Printing	118 70
Telephones and Telegraph	33 90
Stationery.....	52 11
Typewriter.....	145 50
Files, ink, pencils, pens, etc.....	554 48

Drafting and Blue Printing—

Blue print paper.....	102 19
Tracing paper.....	17 00
Map “	10 06
Profile “	27 15
Ink and Miscellaneous paper.....	45 65

Field—

Livery.....	268 50
Repairs.....	11 00
Supplies.....	58 99
Testing.....	30 25
Car fare	786 55
Miscellaneous	75 74

2553 62

Inspection—

Ann street bridge.....\$	60 50
Contagious disease hospital.....	159 60
Pearl street sidewalk.....	1 75
Wealthy avenue bridge pier fenders.....	38 00
Bridge street bridge seats.....	58
Corporations.....	577 41
Improvements	4915 67
Sewers.....	4791 53
Water works extension mains.....	307 82
Standpipe	149 48
Street opening—work.....	977 40
—street	465 21

12442 85

Total.....\$32644 11

The general fund is reimbursed for a large portion of the expense for large improvements and miscellaneous work.

Considerable special work in connection with street openings, flood surveys, and grade separation work has made the office and field expenses considerably larger

than heretofore. A large percentage of the car ~~fare~~ is also chargeable to special work.

Respectfully submitted.

L. W. ANDERSON,

City Engineer

1870-1871

1870-1871

1870-1871

1870-1871

1870-1871



NOV 1. 1908

THIRTY-FIFTH

ANNUAL REPORT

★
OF THE

Board of Public Works

TO THE

COMMON COUNCIL

OF THE

City of Grand Rapids, Mich.

**TRANSMITTING THE REPORTS OF THE SECRETARY AND
GENERAL MANAGER, CITY ENGINEER, CHIEF
CLERK AND CHIEF INSPECTOR**

FOR THE

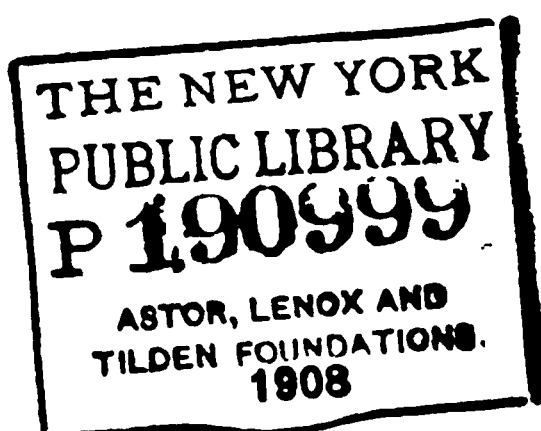
YEAR ENDING MARCH 31, 1908

**GRAND RAPIDS, MICH.
PRESS OF WEST MICHIGAN PRINTING Co.**

1908

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V-111A



REPORT OF THE BOARD OF PUBLIC WORKS

GRAND RAPIDS, MICH , April 1, 1908.

To the Honorable Common Council:

GENTLEMEN:—Herewith are transmitted Annual Reports from the Departments of the Municipal Government under the jurisdiction of this Board, also inventories covering the Water Works and Electric Lighting systems and City Bridges.

Respectfully submitted,

CHAS. M. WILSON, President.

GEO. C. PEIRCE,

WM. M. GORMLEY,

HENRY J. KLEVORN,

EDWARD H. CHRIST.

REPORT OF THE SECRETARY AND GENERAL MANAGER

OFFICE OF THE BOARD OF PUBLIC WORKS, }
GRAND RAPIDS, MICH., April 1, 1908. }

To the Honorable Board of Public Works:

GENTLEMEN:—We respectfully submit to your Honorable Body a resume of the work accomplished by the several departments of the City Government under your jurisdiction, for the year ending March 31, 1908 viz: Annual statements covering Water Works System, Electric Lighting System and Engineering Department. Inventories covering Water Works and Lighting Systems and Bridges.

On October 1, 1907, under charter amendments the Sewer and Highway Departments were placed under the jurisdiction of this Board. A synopsis of last years' receipts and disbursements is included in this report. Under a new system of accounting etc., we will be prepared to submit a detailed report in the future.

WATER WORKS

TOTAL INVESTMENT AS SHOWN BY BOOKS, DEDUCTIONS AND DEPRECIATION.

	Total	Charged Off	Removed	Present Values
Water Mains.....	\$1,270,686.22	\$ 46,976.63	\$134,458.13	\$1,089,406.57
Pumping Station (property).....	70,218.26	18,895.26	281.39	51,041.61
Pumping Station (machinery).....	309,861.06	80,719.61	31,433.99	97,707.45
Reservoirs.....	113,330.66	28,675.89	28,700.10	55,954.67
Intakes	99,280.72	3,817.75	18,831.08	6,631.89
Standpipes	45,064.41	6,145.24	59.61	38,856.56
Water meters and connections.....	92,551.45	8,988.15	3,169.94	80,443.36
Surveys, engineering, etc., on new water supply.....	17,026.83	17,026.82	.....	.....
Miscellaneous maintenance amounts improperly charged and classified	46,976.63	46,976.63	.....	.....
For lowering water mains and services on improved streets paid from Extention Fund, transferred to maintenance accounts	7,676.43	7,676.43	.....	.....
	\$1,902,662.70	\$ 265,603.55	\$216,987.94	\$1,420,041.91

You will please notice that the total value of the Water Works system according to the book account is \$1,902,662.70 and that the depreciation, discarded apparatus, etc., amounts to \$482,620.79 leaving an actual value of \$1,420,041.91.

ELECTRICAL LIGHTING SYSTEM

The book value of the Electric Lighting System on March 31, 1908.....	\$214,614.45
We have charged off for depreciation.....	50,494.77
	\$164,119.68

BRIDGES

Original cost.....	\$422,138.61
Depreciation	63,834.83
	\$358,303.79

The total costs per lamp per annum for operating the Electric Lighting Department (including fixed charges, etc.) are as follows:

Maintenance and operation.....	\$30.21
Loss through non-taxation	2.76
Depreciation.....	6.54
Bond interest.....	6.23
Interest on balance of investment which was raised through general taxes.....	4.46
	\$50.20

Just prior to the installation of the Municipal Lighting System the city was paying a private corporation \$97.00 per lamp per year.

For the kind and courteous co-operation of your Honorable Body and for the loyal performance of duty on the part of the heads of departments and all employees of this Board, acknowledgement is hereby given.

Respectfully submitted,

SAMUEL A. FRESHNEY,

Secretary and General Manager.

REPORT OF CHIEF CLERK.

SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR:—Herewith is presented Annual Report of the Water Works System and Lighting Plant showing the cost of operation and maintenance of the Pumping Station, Lighting Plant and Water Works System; also financial statements pertaining thereto.

WATER WORKS FUND.

Annual statement of receipts and disbursements for the year ending March 31, 1908.

TOTAL RECEIPTS		TOTAL DISBURSEMENTS	
For water rates.....	\$150,688 63	Maintenance of Station.....	\$37,616 13
For water for fire hydrants..	9,000 00	Distribution	12,730 21
For water for flushing sewers	2,000 00	Inspection dept.....	3,842 63
For water furnished fire engine houses.....	275 00	Office dept.....	4,270 10
For water permits.....	2,360 00	Construction.....	16,360 06
For plumbers licenses	440 00	For refunded water rates....	233 73
For reading and repairing water meters.....	12,874 65	Deposited to sinking fund....	75,376 65
For sale of water meters.....	335 00		
For setting water meters.....	1,820 52		
For sale of material.....	6,378 33		
For fines and capping.....	155 40		
Total receipts.....	\$186,327 53	Total disbursements.....	\$150,428 51

DETAIL OF RECEIPTS AND DISBURSEMENTS.

STATION.

	Credit	Debit	Cr. Bal.	Dr. Bal.
Superintendence.....		\$666 60		
Clerks.....		248 75		
Engineers.....		3,029 96		
Fireman, Coal-passers, etc.....		6,490 19		
Buildings and grounds.....		314 82		
Engines.....		2,841 39		
Boilers.....	\$173 65	1,480 42		
Coal.....	565 76	21,682 10		
Oils.....	70 89	503 02		
Waste.....	24 11	274 06		
Supplies and tools.....	7 36	584 82		
	\$841 77	37,616 13		\$36,774 36

DISTRIBUTION.

	Credit	Debit	Cr. Bal.	Dr. Bal.
Superintendence.....		\$1,736 60		
Clerks.....		961 25		
Water mains.....	\$306 08	1,464 28		
Reading meters.....	6,433 85	1,345 48		
Repairing meters.....	6,440 80	1,202 71		
Supplies and tools.....	257 24	723 50		
Stables	40 00	1,226 52		
Reservoir		4 38		
Fire hydrants.....	13 28	1,011 14		
Sprinkling cranes.....		17 34		
Valves	4 70	178 56		
Services.....	3,248 27	2,658 60		
Shop and Storeroom.....		99 27		
Books.....		80 00		
Intake.....		58		
	\$16,743 22	\$12,730 21	\$4,013 01	

INSPECTION DEPARTMENT.

	Credit	Debit	Cr. Bal.	Dr. Bal.
Chief inspector and assistants.....		\$3,492 66		
Stables.....		229 13		
Car tickets.....		100 00		
Supplies.....		12		
Telephone.....		20 47		
Fines and capping.....	\$155 40	25		
	\$155 40	\$3,842 63		\$3 687 23

OFFICE DEPARTMENT.

	Credit	Debit	Cr. Bal.	Dr. Bal.
Clerks.....		\$2,999 59		
Books, blanks, etc.....		439 91		
Postage.....		136 84		
Telephones		28 00		
Office supplies.....		506 98		
Offices expenses.....		158 78		
		\$4,270 10		\$4 270 10

EXTENSION AND CONSTRUCTION.

	Credit	Debit	Cr. Bal.	Dr. Bal.
Machinery	\$267 40	\$2,975 24		
New water mains.....	3,751 09	2,521 47		
Water meters.....	335 00	7,611 12		
Setting meters.....	1,820 52	1,740 58		
Supplies.....		47 72		
New water supply.....	9 50	1,433 93		
	\$6,183 51	\$16,360 06		\$10,176 55

COLLECTION DEPARTMENT.

	Credit	Debit	Cr. Bal.	Dr. Bal.
For water rates collected.....	150,688 63			
Deposited to sinking fund.....		75,876 65		
Water for fire hydrants.....	9,000 00			
Water for flushing sewers.....	2,000 00			
Water furnished fire engine houses.....	275 00			
For plumber's licenses.....	440 00			
For refunded water rates.....		232 73		
	162,403 63	75,609 38	86,794 25	

SUMMARY.

	Credits	Debits
Cash on hand, April 1, 1907.....	42,458 65	
Station.....		86,774 26
Distribution	4,013 01	
Inspection department.....		3,687 23
Office department.....		4,870 10
Construction.....		10,176 55
Collection department.....	86,794 25	
Cash on hand, March 31, 1908.....		78,857 87
	132,266 11	132,266 11
Cash on hand April 1, 1908.....	78,857 87	

Accts. Recv. (Material).....\$ 402 14	Accts. Payable.....\$ 368 80
" " (Permits) 10 00	
" " (Water rates)..... 3,641 01	
" " (Meter charge)..... 632 05	
\$ 4,685 20	\$ 368 80

Total paid for maintenance and operation previous to April 1, 1907.....	\$ 1,368,018 69
Paid during last year.....	44,731 69
Total paid to date	\$ 1,412,750 38
Total paid on construction account during past year from Water Works fund.....	10,176 55
Total paid during past year from Water Works extension fund.....	80,900 58
Total paid for construction account during past year.....	91,137 13
Paid previous to March 31, 1907.....	1,811,525 57
Total investment as shown by book to date.....	\$ 1,902,662 70
DEDUCTIONS :	
Mains and machinery abandoned and removed since the year 1878.....	\$ 216,927 24
Depreciation (as per tables following).....	194,013 62
Surveys, engineering, etc., on new water supply.....	17,026 89
Miscellaneous maintenance accounts.....	54,653 11
	\$ 482,620 79
Present value as shown by inventory.....	\$ 1,420,041 91

ANNUAL STATEMENT OF OPERATION OF CITY PUMPING STATION

DETAIL STATEMENT OF OPERATION OF CITY PUMPING STATION

	Total cost of	Average cost per day	Average cost per million gallons	Average cost per million gallons raised one foot. (Dynamic)
Coal	22,236 09	60 76	4 13	.0234
Wages	10,407 83	28 44	1 93	.0109
Repairs	3,772 32	10 31	70	.0041
Supplies	1,071 28	2 92	20	.0010
Oils and grease	451 07	1 23	08	.0005
	37,938 59	103 66	7 04	.0399

Total pounds of coal consumed.....17,906,929
 Average pounds consumed per day..... 48,926
 Average cost of coal per 2,000 pounds..... \$2.48

COMPARATIVE STATEMENT

	1903-4	1904-5	1905-6	1906-7	1907-8
Average gallons pumped per day	14,092,458	13,986,651	12,404,970	14,772,492	14,728,615
Average cost to pump 1,000,- 000 gallons	\$7 59	\$7 00	36 48	36 59	\$7 04

WATER REPORT
TABLE SHOWING THE AMOUNT OF WATER PUMPED INTO THE HIGH AND LOW SERVICES FOR
THE YEAR ENDING MARCH 31, 1908, AND THE TOTAL PUMPING RECORD.

	LOW SERVICE			HIGH SERVICE	
	Total Gallons pumped per month	Average Gal- lons pumped per day	Total Gallons pumped per month	Average Gal- lons pumped per day	Total Gallons pumped per day
April	341,842.578	12,728.086	210,909.848	7,032.328	5,095,768
May	412,253.330	12,975.914	220,081.379	7,099.367	5,876,547
June	479,104.192	15,970.139	256,603.332	8,553.446	7,416,093
July	533,549.321	17,919.558	305,613.067	9,858.360	7,354,308
August	595,659.141	19,916.101	322,276.481	10,396.016	8,620,095
September	529,302.274	17,645.409	312,219.800	10,407.328	7,238,081
October	463,195.557	14,941.824	269,445.933	8,691.804	6,250,090
November	429,173.574	14,305.796	262,441.056	8,429.369	5,476,429
December	415,044.545	13,066.599	251,436.161	8,239.876	4,846,723
January	394,540.776	12,836.154	247,516.674	7,244.409	4,871,745
February	393,768.044	12,576.210	245,634.734	8,470.163	5,108,047
March	379,644.340	12,346.591	237,745.776	7,669.318	4,577,373
Total	5,391,239.095	14,724.615	3,136,416.329	8,569.299	6,159,316
Average					

WATER WORKS BONDS AND INTEREST.

SERIES	DUE	Date of Issue	Date of Maturity	Com. & Ex.	Principal	Rate	Int. and Ex.	Total
Fourth	Sept. 1.....	Sept. 1888.....	Sept. 1908.....	\$7 50	\$150,000 00	5 %	\$ 3,757 50	\$ 7,515 00
Fifth	March 1.....	May 1889.....	May, 1909.....	7 50	80,000 00	5 %	3,757 50	
	May 1.....			4 00			2,004 00	
	Nov. 1.....			4 00			2,004 00	
Sixth	Jan. 1.....	Jan. 1892.....	Jan. 1912.....	13 50	300,000 00	4 1/4 %	6,763 50	4,008 00
	July 1.....			13 50			6,763 50	13,527 00
Refund.....	Oct 1.....	Oct. 1893.....	Oct 1913.....	10 12	235,000 00	4 1/4 %	5,072 62	
First	April 1.....			10 12			5,072 62	10,145 24
Refund.....	June 1.....	June 1896.....		4 00	100,000 00	4 %	2,004 00	
Second	Dec. 1.....	July 1903	June 1915.....	4 00	80,000 00	3 1/4 %	2,014 00	4,008 00
	July		July 1923.....				1,400 00	
Ninth	Jan. 1.....	July 1904	July 1923.....		90,000 00	4 %	1,400 00	2,800 00
	July 1.....						1,800 00	
Tenth.	Jan. 1.....	August 1906.....	July 1924.....		75,000 00	3 %	1,800 00	3,600 00
	August 15.....		August 1926.....				1,500 00	
	Feb. 15.....						1,500 00	3 000 00
Eleventh.....								
					\$1,100,000 00			\$ 48,603 24

WATER WORKS SINKING FUND

	Credit	Debit
Cash on hand April, 1907.....	\$ 34,658 58	
½ of receipts for sale of water.....	75,876 65	
Interest and premium on P. M. Ry. bonds returned.....	261 22	
½ of refunded water rates.....		\$ 188 92
Interest and Exchange on Water Works bonds.....		48,608 24
Cash on hand March 31, 1908.....		61,504 20
	\$ 110,296 45	\$ 110,296 45
Cash on hand April 1, 1908.....	\$ 61,504 20	
Accounts receivable (water rates)	3,641 00	

WATER WORKS EXTENSION FUND

	Credit	Debit
Cash on hand April 1, 1908.....	\$ 33,816 47	
Loan from contingent fund.....	20,000 00	
Sale of material.....	1,927 23	
Disbursements		\$ 80,960 58
Debit balance March 31, 1908.....	23,216 88	
	\$ 80,960 58	\$ 80,960 58
Debit balance April 1, 1908.....		\$ 23,216 88
Accounts receivable (material).....	\$ 149 47	
Accounts payable (loan).....		20,000 00

SUMMARY OF STATISTICS

IN FORM RECOMMENDED BY THE NEW ENGLAND WATER WORKS ASSOCIATION, FOR THE YEAR ENDING MARCH 31, 1908.

GENERAL STATISTICS.

Population by census of 1900, 87,565, and in 1908, 100,000.

Date of construction, 1878.

By whom owned—the city.

Source of supply—Grand River.

Mode of supply—pumping.

PUMPING STATISTICS.

- 1 Builders of Pumping Machinery: Holly, Nordberg and Butterworth & Lowe.

- 2 Description of {
 a Kind: Bituminous.
 b Brand of coal: W. Va. and Michigan Slack.
 c Average price of coal per gross ton delivered: \$2.78A.
 Average price of coal per net ton delivered \$2.48A.
 d Percentage of ash, 8 percent.
 e Wood, price per cord, \$.....

- 3 Coal consumed for the year: 17,906,929 lbs. A.

- 4 (Pounds of wood consumed) ÷ 3 = equivalent amount of coal, none lbs.

- 4a Amount of other fuel used: none.

- 5 Total equivalent coal consumed for the year: = (3) plus (4) 17,906,929 lbs.

- 6 Total pumpage for the year: 5,891,239,095 gallons without allowance for slip. A.

- 7 Average static head against which pumps work: 188.5 (low service) ft.
 Average static head against which pumps work: 197. (high service) ft.

- 8 Average dynamic head against which pumps work: 152. (low service) ft.
 Average dynamic head against which pumps work: 201 (high service) ft.

- 9 Number of gallons pumped per pound of equivalent coal (5) 301 gals.
 gallons pumped (6) x 8.34 (lbs.) x 100 x dynamic head (8)

- 10 Duty = $\frac{\text{gallons pumped (6) x 8.34 (lbs.) x 100 x dynamic head (8)}}{\text{total fuel consumed, (5)}} = 44,317,805$

- 11 Cost of pumping, figured on pumping station expenses, viz.: \$37,938.59 per million gallons pumped. \$7.04 A.

- 12 Per million gallons raised one foot (dynamic) \$0.0399 A.

STATISTICS OF CONSUMPTION OF WATER.

- 1 Estimated population to date: 100,000.

- 2 Estimated population on pipe lines: 75,000.

- 3 Estimated population supplied: 75,000.
- 4 Total consumption for the year: 5,391,239,095.
- 5 Passed through meters: 1,617,371,728 gallons.
- 6 Percentage of consumption metered: 30 per cent.
- 7 Average daily consumption: 14,728,615 gallons.
- 8 Gallons per day to each inhabitant: 147.2 gallons.
- 9 Gallons each day to each consumer: 196.4 gallons.
- 10 Gallons each day to each tap: 843 gallons.
- 11 Cost of supplying water, per million gallons, figured on total maintenance (item CC) \$10.92.
- 12 Total cost of supplying water, per million gallons, figured on total maintenance plus interest on bonds: \$19.94.

STATISTICS RELATING TO DISTRIBUTION SYSTEM.

MAINS.

- 1 Kind of pipe: cast iron.
- 2 Sizes: from 4 inch to 36 inch.
- 3 Acquired and extended, 374,140.8 feet during year.
- 4 Discontinued: 3,141 6 feet during year.
- 5 Total now in use: 172 miles 3104 feet.
- 6 Cost of repairs per mile: 84 cents.
- 7 Number of leaks per mile: one-half.
- 8 Length of pipe less than 4 inch diam.: none.
- 9 Number of hydrants added during year (public) 84.
- 10 Number of hydrants (public) now in use: 1658.
- 11 Number of stop gates added during the year: 133.
- 12 Number of stop gates now in use: 1789.
- 13 Number of stop gates smaller than 4 inch.
- 14 Number of blow-offs: 7.
- 15 Range of pressure on mains: 22 lbs to 93 lbs.

SERVICES.

- 16 Kind of pipe: $\frac{1}{2}$ inch to 2 inch "strong" lead pipe. 2 inch to 4 inch galv. iron pipe.
- 17 Sizes: $\frac{1}{2}$ inch to 6 inch.
- 18 Extendedfeet.
- 19 Discontinuedfeet.
- 20 Total now in use.....feet.
- 21 Number of service taps added during year: 938.
- 22 Number now in use: 16226.
- 23 Average length of service: 25 ft.

- 24 Average cost of service for the year: \$.....
- 24a Average cost of service for the year (private) \$.....
- 25 Number of meters added during year: 850.
- 26 Number now in use: 5468.
- 27 Percentage of services metered: 34%.
- 28 Percentage of receipts from metered water (B ÷ C) 46%.
- 29 Number of motors and elevators added: 5.
- 30 Number now in use: 50

FINANCIAL STATISTICS.

RECEIPTS.

Balance brought forward: (a) from ordinary (main-		
tenance) receipts.....	\$	77,117 43
(b) From extraordinary receipts (bonds).....		35,816 47
		<hr/>
Total	\$	112,933 90
From water rates (a) fixture rates.....	\$	81,555 47
(b) Meter rates		69,133 16
		<hr/>
(c) Total from consumers.....		150,688 63
(d) For hydrants.	9,000 00	
(e) For fountains, metered.....		
(f) For street watering and flushing sewers.....	2,000 00	
(g) For public building, metered (fire engine houses)	275 00	
(h) Miscellaneous uses.....		
(i) General appropriation		
(j) Total from municipal departments.....		11,275 00
(k) From tax levy.....		
(l) From bond issue.....		20,261 22
(m) From other sources:		
Water permits	2,367 00	
Plumber's licenses.....	440 00	
Reading and repairing water meters.....	12,874 65	
Sale of water meters.....	335 00	
Setting water meters	1,820 52	
Sale of material.....	8,305 56	
Fines and capping charges.....	155 40	
	\$	26,291 18
		<hr/>
Net total.....	\$	321,449 88

EXPENDITURES.**Water works maintenance.**

(aa) Operation (management and repairs).....\$ 58,880 72

(bb) Special

(cc) Total maintenance.....\$ 58,880 72

(dd) Interest on bonds..... 48,603 24

(cc plus dd) Maintenance and interest.....\$ 107,483 96

(ee) Payment of bonds.....

(ff) Sinking fund..... 61,504 29

Water works construction.

(gg) Extension of mains..... 70,828 74

(hh) Extension of services.....

(ii) Extension of meters..... 9,881 70

(jj) Special:

Standpipe..... 12,658 81

Pumping station..... 3,022 96

New water supply investigation..... 1,488 93

Plus.

(kk) Total construction.....\$ 97,820 64

(ll) Unclassified expenses.....

(mm) Balance.

(aa) Ordinary..... 78,857 87

(bb) Extraordinary (debit bal)..... 28,216 88

Total balance.....\$ 55,140 99

Net total.....\$ 321,449 88

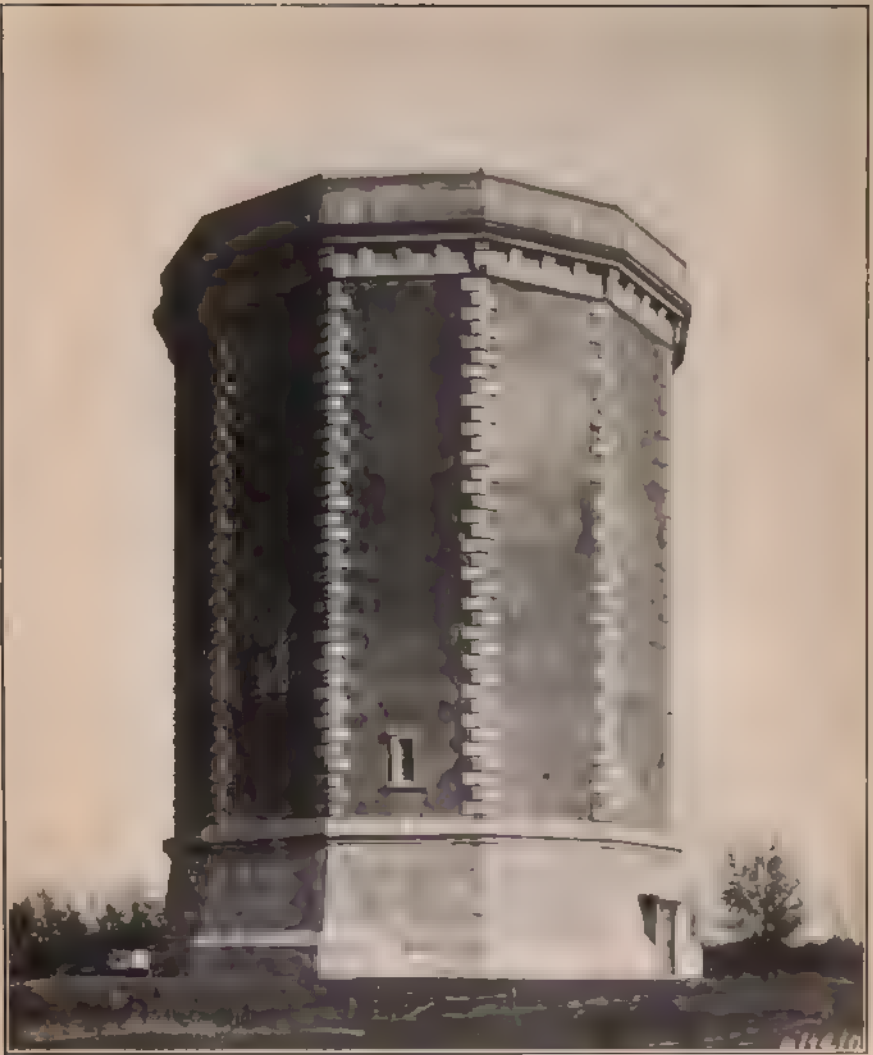
Disposition of balance retained as working capital:

(o) Net cost of works to date.....\$ 1,902,000 70

(p) Bonded debt to date..... 1,100,000 00

(q) Value of sinking fund to date..... 61,504 29

(r) Average rate of interest..... 4.4%



STAND PIPE

West Elevation Showing Completed Structure.

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS.

LIGHTING PLANT.**ANNUAL STATEMENT OF RECEIPTS AND DISBURSEMENTS
FOR THE YEAR ENDING MAR. 31, 1908.**

TOTAL RECEIPTS		TOTAL DISBURSEMENTS	
Budget appropriation, operation.....	\$ 25,000 00	Maintenance of station.....	\$ 20,108 66
Budget appropriation, construction.....	1,000 00	Distribution	9,812 10
Rent of arc lamps on Market site	72 00	Office dept.....	324 99
Material sold.....	511 87	Construction.....	1,048 28
	<u>\$ 26,583 87</u>		<u>\$ 31,293 98</u>

DETAIL OF RECEIPTS AND DISBURSEMENTS.**STATION.**

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Superintendence.....		\$1,833 90		
Clerk.....		475 00		
Engineers.....		1,940 00		
Firemen, coal-passers, etc.....		1,943 05		
Dynamo-tenders		1,320 00		
Buildings and ground.....		260 52		
Engine repairs.....		234 38		
Boiler repairs.....	\$118 00	419 99		
Coal.....		10,770 45		
Oils and grease.....	20 88	293 08		
Waste.....		99 27		
Dynamo repairs.....		478 28		
Switchboard and connections.....		85 11		
Supplies and tools.....	3 75	526 35		
	<u>\$142 63</u>	<u>\$20,108 66</u>		<u>\$19,966 03</u>

DISTRIBUTION.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Trimmers and linemen.....		\$4,002 24		
Lines and cables.....	\$91 08	868 69		
Lamp posts.....		2 10		
Towers.....	2 00	342 98		
Lamps (including salary of repairer)....	8 88	1,250 43		
Globes.....	1 00	1,230 51		
Carbons.....		1,166 82		
Trimming supplies.....		22 35		
Stables.....		925 98		
	<u>\$103 96</u>	<u>\$9,812 10</u>		<u>\$ 9,709 14</u>

OFFICE DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Clerks.....		\$299 84		
Printing and stationery.....		34 35		
Office supplies.....		90		
		\$324 99		\$324 99

CONSTRUCTION DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Buildings and grounds.....		\$5 00		
Steam plant.....	\$17 02			
Lines and cables.....	249 26	902 42		
Lamp posts.....		49 60		
New system investigation.....		90 21		
	\$266 28	\$1,048 23		\$781 95

COLLECTION DEPARTMENT.

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Budget appropriation.....	\$26,000 00			
Rent of arc lamps.....	72 00			
	\$26,072 00		\$26,072 00	

SUMMARY.

	Credits	Debit
Cash on hand April 1, 1907.....	\$5,188 75	
Station.....		19,966 08
Distribution		9,709 14
Office department.....		324 99
Construction department.....		781 95
Collection department.....	26,072 00	
Cash on hand March 31, 1908.....		478 64
	\$31,260 75	\$31,260 75
Cash on hand April 1, 1908.....	478 64	

Accts. recv. (Material).....\$ 16 09 Accts. Payable.....\$ 1,581 73

Total amount paid for maintenance and operation previous to April 1, 1908.....	\$	185,703 93
Paid during past year.....		30,000 16
Total amount paid to date.....	\$	215,704 09
Total amount paid for construction previous to April 1, 1907....	\$	213,832 50
Paid during past year.....		781 95
Total amount paid to date.....	\$	214,614 45
Less depreciation (per inventory) to date.....	\$	50,494 77
Present value of plant per inventory.....	\$	164 119 68

INVENTORY.

Engines.....	\$	14,505 16
Boilers.....		16,857 56
Crane.....		1,276 85
Elec. equipment		12,845 28
Buildings and grounds.....		42,189 06
Towers		8,911 51
Lines and cables.....		66,896 14
Supplies.....		1,338 12
Total.....	\$	164,119 68
Supplies and tools for station.....		2,790 74

BONDS ISSUED.

\$125,000.00 issued May 1897, 4 per cent int. \$7.00 exchange, total interest and exchange \$5,007.00.

DETAIL STATEMENT OF OPERATION OF THE CITY LIGHT-ING PLANT.

	Total cost	Average cost per day	Aver. cost per lamp per day	Aver. cost per kilo-watt hr	Aver. cost per lamp hour
Coal.....	\$12,193 07	\$33 31	.0414304	.008308	.00433
Wages.....	12,378 71	33 83	.0420647	.008334	.00441
Carbons.....	1,147 16	3 14	.0039054	.000774	.00041
Globes	1,256 46	3 44	.0042786	.000848	.00045
Repairs	2,267 44	6 19	.0076990	.001525	.0008
Supplies.....	1,956 04	5 34	.0066418	.001316	.00069
Oils.....	328 06	90	.0011194	.000222	.00012
Total	\$31,526 93	\$36 14	.1071393	.021227	.01121

Total pounds of coal consumed.....	9,908,706	
Average pounds consumed per day.....	27,073	
Average cost of coal per 2,000 pounds.....		\$ 2 46
Average kilo-watt hours per day.....	4,058	
Average number of lamps in circuit per day.....	812	
Average number reported out per day.....	8	
Average number operated per day.....	804	
Average number of hours operated per day.....	10:36	
Average number of lamp hours per day.....	7,684	
Total number of lamp hours.....	2,812,388	
Average cost per lamp per year computed on above basis.....		39 21
Average cost per lamp hour (operation only).....	.00776	
Average cost per lamp hour (distribution only).....	.00846	

COMPARATIVE STATEMENT.

	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08
Number of lamps operated...	578	623	687	726	781	804
Cost per lamp per year.....	43 40	43 85	40 35	35 14	35 80	30 21

Contract price before plant was built was, in first contract \$120.00 per lamp per year. In second contract, \$107.00 per lamp per year. Contract price just prior to the installation of the Municipal Plant was \$97.00 per lamp per year.

LIGHTING MUNICIPAL BUILDINGS.
CONSTRUCTION.

STATEMENT OF RECEIPTS AND DISBURSEMENTS UP TO
MARCH 31, 1908.

Receipts	Disbursements
Total appropriations.....\$ 11,500 00	Printing and advertising.....\$ 111 06
Sale of materials 188 58	Machinery 3,971 40
	Foundations... .. 286 01
	Switchboard..... 39 13
	Lines and cables..... 2,050 63
	Interior wiring..... 4,802 72
	Engineering..... 51 00
	Meters and instruments..... 165 36
\$ 11,688 58	\$ 11,630 31
Cash on hand April 1, 1907.....\$ 1,228 95	
Disbursed during past year.....	\$ 3,859 26
Appropriation received..... 2,500 00	
Material sold..... 188 58	
Balance cash on hand Mar. 31, 1908	58 27
\$ 3,917 53	\$ 3,917 53

REVENUE ACCOUNT.

Receipts	Disbursements
Cash on hand April 1, 1907..... \$54 83	Lamps\$ 99 80
Current for City Hall 1,489 74	Supplies 17 75
Current for Library..... 641 94	Coal..... 1,393 84
Current for Police Hdqrs..... 145 32	Lines and cables..... 7 97
Current for High School..... 21 69	Interior wiring..... 8 15
Sale of lamps..... 28 12	
	\$ 1,521 51
Balance cash on hand Mar 31, 1908	863 13
\$ 2,384 64	\$ 2,384 64
Cash on hand April 1, 1908..... 863 13	
Accts. rec. for current..... 315 03	

LABORATORY TESTING DEPARTMENT.

Receipts		Disbursements	
Cash on hand April 1, 1907.....	\$ 1,660 16	For gas testing.....	\$ 187 82
Receipts for gas meter tests.....	3 00	For electrical tests.....	210 07
		For material tests.....	620 66
			<hr/>
			\$ 968 25
Bal. cash on hand Mar. 31, 1908...			604 91
			<hr/>
	\$ 1,663 16		\$ 1,663 16
Cash on hand April 1, 1908.....	604 91		

STREET SPRINKLING.

On July 23, 1906 a contract was entered into with the Grand Rapids Railway Co. wherein the Railway Co. agrees to sprinkle the full width of the streets which are occupied by its tracks. They to receive as compensation for this work the sum of twelve cents per mile of street sprinkled regardless of the width of the street, the City furnishing the water for this purpose free of charge to the Railway Co.

The equipment furnished by the Railway Co. for this service consists of two electrically driven, steel tank cars, one of 2800 gallon capacity and one of 4200 gallon capacity.

Under this contract sprinkling was first started on Sept. 26, 1906, but owing to the lateness of the season very little sprinkling was done.

On March 25, 1907, sprinkling for the past season was started and was carried on until Nov. 1, 1907. The following is a statement of the cost, etc. of this work.

Number of miles of street sprinkled.....	8,417.85 @ 12c per mile	\$1,010 16
Gallons of water used.....	13,602,800 @ 4c per M gals	544 11
		<hr/>
Total cost of sprinkling.....		\$1,554 27
Cost of sprinkling per mile.....		.12
Cost of water per mile.....		.0646
		<hr/>
Total cost per mile.....		.1846
Average gallons of water used per mile.....		1616

ANNUAL STATEMENTS OF RECEIPTS AND DISBURSEMENTS ON HIGHWAYS AND SEWERS.

FIRST SEWER DISTRICT.

Comprising the 1st, 3rd, 10th, 11th and 12th wards.

Balance in fund April 1, 1907.....	\$	585 51	
Budget appropriation.....		4,000 00	
Misc. receipts.....		67 60	
Disbursements.....			\$ 3,017 07
To balance.....			1,635 44
		<hr/>	
		4,653 11	4,653 11
Balance in fund April 1, 1908.....		1,635 44	

SECOND SEWER DISTRICT.

Comprising the 6th, 7th, 8th and 9th wards.

Balance in funds April 1, 1907.....	\$	1,248 83	
Budget appropriation.....		5,000 00	
Misc. receipts.....		21 24	
Disbursements.....			\$ 6,203 44
To balance.....			66 63
		<hr/>	
	\$	6,270 07	\$ 6,270 07
		66 63	
Balance in funds April 1, 1908.....			

THIRD SEWER DISTRICT.

Comprising the 2nd, 4th and 5th wards.

Balance in fund April 1, 1907.....	\$	2,136 46	
Budget appropriation.....		6,000 00	
Misc. receipts.....		8 15	
Disbursements.....			\$ 3,147 03
To balance.....			4,992 58
		<hr/>	
	\$	8,139 61	\$ 8,139 61
		4,992 58	
Balance in fund April 1, 1908.....			

SUMMARY.

Balance in fund April 1, 1907.....	\$	3,970 80	
Budget appropriation.....		15,000 00	
Misc. receipts.....		91 99	
Disbursements.....			\$ 12,368 14
To balance.....			6,694 65
		<hr/>	
	\$	19,062 79	\$ 19,062 79
		6,694 65	
Balance in fund April 1, 1908.....			

FIRST WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	941 54	
Budget appropriation.....		7,500 00	
Misc. receipts.....		10 34	
Disbursements.....			\$ 6,567 34
To balance.....			1,854 44
		<hr/>	
	\$	8,451 78	\$ 8,451 78
		1,854 44	
Balance in fund April 1, 1908.....			

SECOND WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	982 93	
Budget appropriation.....		7,500 00	
Disbursements.....			\$ 10,283 38
Overdraft.....		1,849 45	
		<hr/>	
	\$	10,283 38	\$ 10,283 38
			1,849 45
Overdraft April 1, 1908.....			

THIRD WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	1,793 61		
Budget appropriation.....		7,500 00		
Misc. receipts.....		6 94		
Disbursements.....			\$	8,161 35
To balance.....				1,138 48
				<hr/>
Balance in fund April 1, 1908.....	\$	9,299 85	\$	9,299 85
		1,138 48		

FOURTH WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	1,835 61		
Budget appropriation.....		7,000 00		
Misc. receipts.....		1 00		
Disbursements.....			\$	8,793 31
Overdraft.....		456 70		
				<hr/>
Overdraft April 1, 1908.....	\$	8,793 31	\$	8,793 31
				456 70

FIFTH WARD HIGHWAY.

Overdraft April 1, 1907.....			\$	196 46
Budget appropriation.....	\$	7,000 00		
Misc. receipts.....		4 87		
Disbursements.....				6,020 74
To balance April 1, 1908.....				787 07
				<hr/>
Balance in fund April 1, 1908.....	\$	7,004 87	\$	7,004 87
		787 07		

SIXTH WARD HIGHWAY.

Balance in fund April 1, 1907.....		93 39		
Budget appropriation.....		8,000 00		
Loan from general fund.....		2,000 00		
Misc. receipts.....		5 99		
Disbursements.....				7,243 48
Return of loan to general fund.....				2,800 00
To balance.....				55 90
				<hr/>
Balance in fund April 1, 1908.....	\$	10,099 38	\$	10,099 38
		55 90		

SEVENTH WARD HIGHWAY.

Overdraft April 1, 1907.....			\$	137 40
Budget appropriation.....	\$	5,900 00		
Loan from general fund.....		1,400 00		
Disbursements.....				6,101 24
Return of loan to general fund.....				250 00
Overdraft April 1, 1908.....		88 64		
				<hr/>
Overdraft April 1, 1908.....	\$	6,488 64	\$	6,488 64
				88 64

EIGHTH WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	83 66		
Budget appropriation.....		2,500 00		
Loan from general fund.....		700 00		
Misc. receipts.....		5 20		
Disbursements.....			\$	3,678 04
Return of loan from general fund.....				450 00
To balance.....				160 82
				<hr/>
Balance in fund April 1, 1908.....	\$	4,288 86	\$	4,288 86
		160 82		

NINTH WARD HIGHWAY.

Overdraft April 1, 1907.....		\$	2 96
Budget appropriation.....	\$	3,800 00	
Loan from general fund.....		1,900 00	
Misc. receipts.....		12 00	
Disbursements.....			4,962 80
Return of loan to general fund.....			450 00
To balance.....			296 24
	\$	5,712 00	\$ 5,712 00
Balance in fund April 1, 1908.....		296 24	

TENTH WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	443 98	
Budget appropriation.....		6,000 00	
Misc. receipts.....		6 24	
Disbursements.....			\$ 6,256 30
To balance.....			193 92
	\$	6,450 22	\$ 6,450 22
Balance in fund April 1, 1908.....		193 92	

ELEVENTH WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	2,200 52	
Budget appropriation.....		5,500 00	
Misc. receipts.....		6 24	
Disbursements.....			\$ 5,277 55
To balance.....			2,329 21
	\$	7,706 76	\$ 7,706 76
Balance in fund April 1, 1908.....		2,329 21	

TWELFTH WARD HIGHWAY.

Balance in fund April 1, 1907.....	\$	964 78	
Budget appropriation.....		4,500 00	
Misc. receipts.....		6 24	
Disbursements.....			\$ 4,214 55
To balance.....			1,256 47
	\$	5,471 02	\$ 5,471 02
Balance in fund April 1, 1908.....		1,256 47	

SUMMARY.

Balance in fund April 1, 1907.....	\$	8,453 20	
Budget appropriation.....		72,800 00	
Loans from general fund.....		6,000 00	
Misc. receipts.....		64 26	
Disbursements.....			\$ 77,689 10
Return of loans to general fund.....			3,950 00
To balance.....			5,678 36
	\$	87,317 46	\$ 87,317 46
Balance in funds April 1, 1908.....		5,678 36	

Respectfully submitted,

JAS. A. KINNEY,

Chief Clerk.

ANNUAL REPORT OF THE INSPECTION DEPARTMENT.

GRAND RAPIDS, MICH., April 1, 1908.

MR. SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR:—Herewith is presented the Annual Report of the Inspection Department for the year ending March 31, 1908:

WATER SERVICES.

Number of schedule services.....	9,076
Number of metered services	5,337
Number of services to curb or lot line only.....	984
Number of services for fire protection.	144
Number of services for elevators.....	44
Number of services for water troughs	58
	<hr/>
	16,226

DISTRIBUTED IN THREE DISTRICTS AS FOLLOWS:

NORTH DISTRICT.

Schedule	3,441
Metered.....	1,826
To curb or lot line only.....	473
	<hr/>
	5,740

SOUTH DISTRICT.

Schedule	3,631
Metered ..	1,954
To curb or lot line only.....	870
	<hr/>
	5,965

WEST DISTRICT.

Schedule	2,843
Metered ..	1,547
To curb or lot line only.....	141
	<hr/>
	4,531

Total number of tapping permits issued from April 1, 1907 to April 1, 1908.	938
Total number of meters in service for which the consumer has advanced the cost	1,875
Total number of services out off at main and abandoned.....	283
Total number of services discontinued and gone to the Hydraulic Co	267

Embodied in the following statement is a report of the work done by the inspectors employed in this department during the past year:

Number of house inspections made.....	4,300
Number of inspections and investigations made and notices served.....	15,650
Number of meter readings.....	34,500
Number of water services to curb inspected	380
Number of high reading meter notices served.....	1,270
Number of water waste notices served	460
Number of leaks found and owners notified.....	1,630
Number of services turned on.....	1,173
Number of services turned off.....	1,232
Number of fixtures capped and uncapped.....	187

METERS.

In the following table are shown the number, kind and size of meters in service on March 31, 1908:

METERS IN USE									
Name	$\frac{1}{8}$ in.	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	2 in.	3 in.	4 in.	6 in.	Total
Nash	3077	95	52	4	13	.....	1	.....	3242
Worthington	308	22	47	1	19	.....	1	.....	399
Crown	1173	104	76	3	31	1	4	1	1451
Thompson	3	1	.....	.....	2	.....	.....	.....	6
Trident	177	3	2	1	1	.....	.....	.....	180
Rotary	6	5	3	.....	.....	1	.....	.....	15
Duplex	13	.....	.....	.....	.....	.....	.....	.....	13
Gem .....	.....	.....	.....	.....	5	6	14	3	27
Hersey	3	10	17	5	.....	.....	.....	.....	41
Lambert	12	5	.....	.....	.....	.....	.....	.....	17
Empire	99	53	.....	.....	5	.....	.....	.....	151
Keystone	3	.....	.....	.....	.....	.....	.....	.....	3
Std. Turbine	3	.....	.....	.....	.....	.....	.....	.....	3
Std. Disc.	1	.....	.....	.....	.....	.....	.....	.....	1
	4775	374	198	15	77	9	20	3	5402

On services where a meter has been installed no record is kept of the water fixtures.

WATER FIXTURES ON SCHEDULE SERVICES.

Baths	3,395
Hopper closets	1,377
Tank closets	5,672
Basins	3,243
Kitchen sinks	4,713
Urinals	65
Yard Hydrants	4,965
Sill cocks	7,530
Hydraulic pumps	434
Water troughs	59
Sprinkling cranes	4
Miscellaneous fixtures	711
Total	33,549

Distributed as follows:

Wards	Baths	Hopper Closets	Tank Closets	Basins	Sinks	Urinals	Hydrants	Sill Cocks	Hydral'c Pumps	Water Troughs	Sprink'g Cranes	Miscellaneous	Totals
1st and 12th...	202	145	456	200	381	1	708	606	4	6	..	58	2767
10th and 11th..	1070	451	1864	1022	1227	8	864	2414	104	11	....	79	9104
3rd	787	400	1498	838	1091	4	599	1507	186	2	....	306	7218
2d, 4th and 5th	779	429	1673	784	1333	18	1247	1431	112	14	4	184	8198
6th and 7th....	263	316	725	214	416	11	1001	821	23	14	....	36	3831
8th and 9th ..	189	136	432	167	247	3	500	536	5	5	....	26	2244
Engine houses	18	.....	24	18	23	20	12	36	.....	..	....	23	173
Parks.. ...	....	.....	.....	.....	.....	..	24	.....	.....	.....	....	.....	24
Cemeteries ...	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	....	.....	10
Totals.....	3308	1877	6672	3243	4718	65	4955	7630	434	53	4	711	33569

HOUSE INSPECTIONS.

During the past year 4,800 house inspections have been made and as usual, the result thereof has been to increase the revenue of the Water Department. About one half of the city has been covered and this work will be continued to completion, which will be about October 1, 1908

Respectfully submitted,
ADOLPH WURZBURG,
Chief Inspector.

METERS.

In the following table are shown the number, kind and size of meters in service on March 31, 1908:

METERS IN USE									
Name	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	1 in.	1 $\frac{1}{2}$ in.	2 in.	3 in.	4 in.	6 in.	Total
Nash	2677	95	63	4	12	.....	1	.....	2342
Worthington	308	32	47	1	19	.....	1	.....	236
Crown	1174	164	76	3	31	1	4	1	1451
Thompson	3	1	.....	.....	2	.....	.....	.....	6
Trident	177	8	2	1	1	.....	.....	.....	190
Rotary	6	5	2	.....	.....	1	.....	.....	15
Duplex	12	.....	.....	.....	.....	.....	.....	.....	12
Gem .....	.....	.....	.....	.....	5	6	14	2	27
Hersey	3	19	17	5	.....	.....	.....	.....	41
Lambert	12	2	.....	.....	.....	.....	.....	.....	17
Empire	99	22	.....	.....	6	.....	.....	.....	123
Keystone	3	.....	.....	.....	.....	.....	.....	.....	2
Std. Turbine	2	.....	.....	.....	.....	.....	.....	.....	2
Std. Disc.	1	.....	.....	.....	.....	.....	.....	.....	1
	4775	274	198	12	77	5	20	3	5468

On services where a meter has been installed no record is kept of the water fixtures.

WATER FIXTURES ON SCHEDULE SERVICES.

Baths	2,308
Hopper closets	1,577
Tank closets	6,672
Basins	2,243
Kitchen sinks	4,713
Urinals	65
Yard Hydrants	4,265
Sill cocks	7,589
Hydraulic pumps	424
Water troughs	59
Sprinkling cranes	4
Miscellaneous fixtures	711
Total	32,569

Distributed as follows:

Wards	Baths	Hopper Closets	Tank Closets	Basins	Sinks	Urinals	Hydrants	Sill Cocks	Hydral'g Pumps	Water Troughs	Sprink'g Cranes	Miscellaneous	Totals
1st and 12th...	202	145	456	200	381	1	708	606	4	6	..	58	2767
10th and 11th...	1070	451	1864	1022	1227	8	854	2414	104	11	..	79	9104
3rd	787	400	1498	833	1091	4	599	1507	186	2	..	306	7218
2d, 4th and 5th	779	429	1673	784	1333	18	1247	1431	112	14	4	184	8198
6th and 7th....	268	316	725	214	416	11	1001	821	23	14	..	36	3831
8th and 9th ..	189	136	432	167	247	3	500	535	5	5	..	25	2244
Engine houses	18	.....	24	18	23	20	12	36	.....	.....	.....	23	173
Parks.. ..	.....	.....	.....	.....	.....	..	24	.....	.....	.....	.....	.....	24
Cemeteries ..	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	10
Totals.....	3308	1877	6672	3243	4718	65	4955	7630	434	52	4	711	33569

HOUSE INSPECTIONS.

During the past year 4,300 house inspections have been made and as usual, the result thereof has been to increase the revenue of the Water Department. About one half of the city has been covered and this work will be continued to completion, which will be about October 1, 1908

Respectfully submitted,
ADOLPH WURZBURG,
Chief Inspector.

REPORT OF THE SMOKE INSPECTOR.

GRAND RAPIDS, MICH., April 1, 1908.

MR. SAMUEL A. FRESHNEY,

Sec'y and Gen'l Mgr. Board of Public Works:

DEAR SIR:—Herewith is presented the Annual Report of the Smoke Prevention Department for the 11½ months ending March 31, 1908.

This department was established under section 125 of the City Charter, and is governed by the provision of an ordinance as adopted and amended on December 26, 1905.

The position of Smoke Inspector was created by a special ordinance passed March 4th, 1907.

The duties of your Smoke Inspector were entered into on April 16, 1907, and since that time the department has confined itself to an educational campaign. No prosecutions have been made as it has been the experience of other cities that greater success has been attained by the educational method, and that prosecution should be avoided as much as possible and only taken up when other methods will not bring the required results. By an educational campaign we mean that we are striving to bring to the attention of the owner and operator that there is economy in preventing smoke, as by so doing he will get the benefit of all the heat in the fuel and in the majority of cases will increase the efficiency of his plant. We also confer and advise with the operating engineer or fireman in regard to the best methods to employ in order to attain a smokeless condition, and endeavor to impress upon the minds of the violators the great nuisance that the emission of smoke causes by destroying property and damaging health.

During the past 11½ months we have taken a record of the equipment, conditions and general data of 297 plants. These we have entered on our card filing system records which are indexed individually for ready reference.

We have made 707 smoke observation charts on which we note the condition of the stack being observed every one-half minute for one hour. These charts are filed in our office and are shown to the operator or owner of the stack in order that he may know his exact smoke condition. We are also able by consulting our files to tell exactly what percentage of smoke has been eliminated after the installation of a device by comparing these observation charts.

NA

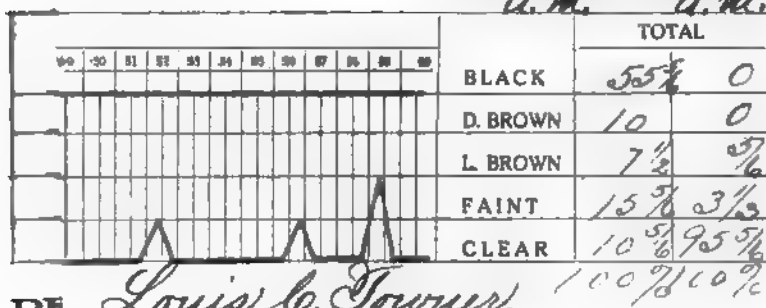
DATE

Aug 24th - Aug 25th / 07.

AI cent. of elimination.

TIME

9:15 to 10:15 A.M. 8:30 to 9:30 A.M.



DE

Louis C. Towner.

SMOKE INSPECTOR.

NA

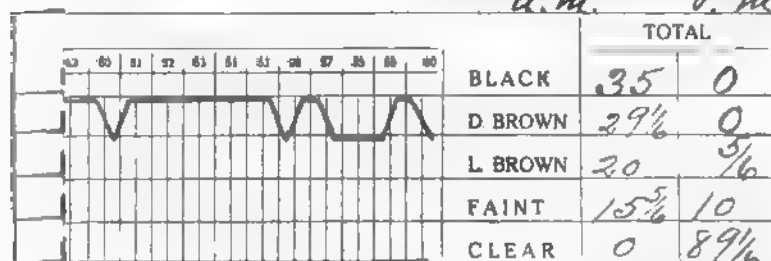
DATE

Aug 15th - Oct 30th / 07.

AI cent. of elimination.

TIME

9:00 to 10:00 A.M. 8:30 to 9:30 A.M.



DE

Louis C. Towner.

SMOKE INSPECTOR.

NA

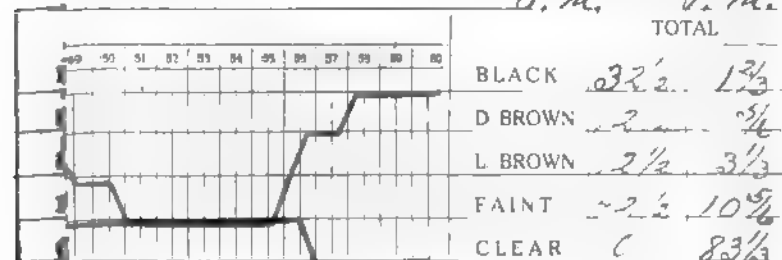
DATE

Oct 29th / 07 - Jan 15th / 08

AD cent. of elimination.

TIME

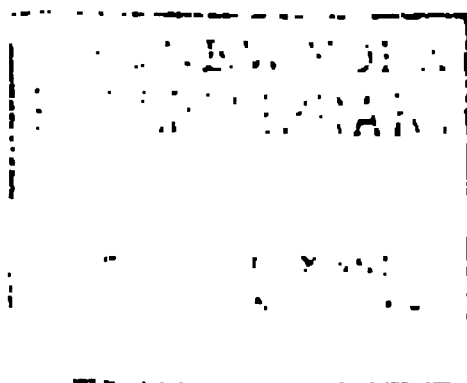
1:55 to 2:55 A.M. 10:30 to 11:30 A.M.



DE

Louis C. Towner.

SMOKE INSPECTOR.



Name—NATIONAL BISCUIT CO. Location—35 to 41 KENT ST. Ward—FOURTH
Engineer—CHAS. ROSSELL. Permit—NO. 3.

	No.	Kind	Size	Remarks
Boiler	1	Woodbury.....	45 H. P.	48 in. diam. 14 ft. long, 33—3 in. tubes
Boiler	1	Brobst.....	90 H. P.	66 in. diam. 18 ft. long, 48—4 in. tubes
Smoke Preventers		Nothing		Tubular boilers, high pressure
Stacks	1	Brick & Steel..	24 in. x 70 ft	Installed automatic stoker on Aug. 23, 1907

Date	INSPECTION	Report
April 17, 1907	The above report was taken.....	Bad
April 20, 1907.....	Chart 40 B., 7½ D. B., 6% L. B.....	Very bad
May 16, 1907.....	Chart 25 5-6 B., 6% D. B., 10 5-6 L. B.....	Very bad
May 23, 1907.....	Chart 49 1-6 B., 10 D. B., 9 1-6 L. B.....	Very bad
May 29, 1907.....	Chart 47½ B., 17½ D. B., 9 1-6 L. B.....	Very bad
June 13, 1907	Chart 20 B., 5 D. B., 8½ L. B.....	Bad
July 2, 1907.....	Chart 21½ B., 11½ D. B., 16% L. B.....	Bad
July 11, 1907.....	Chart 25 B., 12½ D. B., 16% L. B.....	Very bad
July 24, 1907	Chart 17½ B., 5 5-6 D. B., 5 L. B.....	Bad
August 6, 1907.....	Chart 45 B., 4 1-6 D. B., 12½ L. B.....	Very bad
August 8, 1907.	Chart 55 5-6 B., 10 D. B., 7% L. B.....	Very bad
August 26, 1907.....	Chart 29 1-6 B., 9 1-6 D. B., 7% L. B.....	Very bad
August 26, 1907.....	Average 34.22 Black condition.....	Very bad

AUGUST 20, 1907, STARTED AUTOMATIC STOKER.

Date	INSPECTION	Report
September 12, 1907....	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
September 13, 1907...	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
September 13, 1907....	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
September 25, 1907..	Chart 0 B., 0 D. B., 4 1-6 L. B.....	Extra good
October 3, 1907.....	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
November 5, 1907.....	Chart 4 1-6 B., 1% D. B., 14 1-6 L. B.....	Fair
November 20, 1907 ...	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
December 28, 1907. ..	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
December 31, 1907....	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
January 27, 1908	Chart 0 B., 0 D. B., 0 L. B.....	Clear
January 31, 1908	Chart 0 B., 0 D. B., 0 L. B.....	Clear
March 20, 1908... ..	Chart 0 B., 0 D. B., 0 L. B.....	Extra good
April 1, 1908.....	Average percent since stoker installation: Black 34-100 of 1%, D. Brown 13-100 of 1%, L. Brown 1 52-100%.	

Smoke Ordinance Violation Notices to the number of 56 have been served. These notices inform the owner of the violating stack that he must make such changes as may be necessary to cause an abatement of the nuisance.

The records taken on the establishment of this office showed the following installations:

Automatic stokers.....	11
Hand-fired stokers.....	2
Various steam jets	12
Brick bridge walls.....	8
Ordinary settings	265
Total.....	297

A review of the records at the close of business on March 31, 1908, shows the following installations:

Automatic stokers.....	16
Hand-fired stokers	14
Various steam jets.....	12
Brick bridge walls.....	9
Using so-called smokeless coal	19
Heating from exhaust steam from Central Station.....	25
Using coke or hard coal.....	7
Ordinary settings	195
Total.....	297

The Railroad Companies entering our city have shown themselves willing to co-operate with this department in abating the smoke from their locomotives and have instructed their engineers and firemen that they must use every effort to properly burn the coal. They have advised us that they would be pleased to have us report to them the number of any locomotive or locomotives that we find violating the ordinance, and upon such advice they will see that the nuisance is abated.

We have the hearty co-operation of the Civic Societies and feel confident that another years work will bring about a great change in the smoke conditions in our city.

The following is a resume of the past 11½ months work:

Plants visited and records taken.....	297
Smoke observation charts taken.....	707
Smoke violation notices served.....	56
Notice served on owners of heating plant advising them that we expect them to put their plants in a more smokeless condition before another winter.....	15
Number of automatic stokers installed.....	5
Number of hand-fired stokers installed.....	12
Brick bridge walls installed.....	1
Plants induced to burn smokeless coal.	19
Plants induced to burn coke or hard coal.....	7

FINANCIAL STATEMENT.

Budget appropriation.....	\$ 2,000 00	
Salary of inspector, 11 mos.....		\$ 1,100 00
Files and office supplies.....		30 43
Printing blanks, etc.....		27 35
Car fare.....		25 00
Expenses to Milwaukee convention.....		33 75
		<hr/>
	\$ 2,000 00	\$ 1,216 53
Balance on hand March 31, 1908.....	783 47	

It would appear to your Smoke Inspector that it would be an excellent plan to provide for a smoke observation tower during the coming year. An ideal location for this room would be in the tower of the City Hall directly above the clock as with the necessary telephone connections in this room we could keep in close touch with the violators and notify them when they are actually violating the ordinance. It would also be a very desirable place from which to take smoke observation charts.

Very respectfully submitted,

LOUIS C. TOWNER,

Smoke Inspector.

REPORT OF CITY ENGINEER.

GRAND RAPIDS, MICH., April 1, 1908.

MR. SAMUEL A. FRESHNEY,

Sec'y and Gen'l Mgr. Board of Public Works.

DEAR SIR:—Herewith is presented the Annual Report of the work done by the Engineering Department during the fiscal year ending March 31, 1908:

STREETS.

2.693 miles of streets have been added to the total mileage of 291.592 reported a year ago making a total of 294.285 miles. 181.661 miles have been improved, 7,289 miles of which have been improved this year, leaving 112.624 miles or about 33 per cent of the total miles still unimproved.

STREET IMPROVEMENTS.

Street improvement bonds to the amount of \$255,000.00 were issued during the year. The work contracted for during the year amounted to \$292,172.00.

Most of the work was ordered and contracted for early in the year. The Grand Rapids Railway Company had a supply of rails on hand so no delay was encountered from that source, and all of the brick work was completed and opened to travel before winter. Some of the gravel streets were delayed by the water pipe but all of them had at least one layer of gravel put on and rolled and were in good condition for winter.

Metropolitan, Trimble and Nelsonville blocks were used in paving. Following the practice begun the previous year, all brick were inspected on the cars and generally a very uniform and good quality of brick was obtained.

"Pioneer" asphalt filler was used for expansion joints, and on one block of Kent street where traffic was such as to make necessary the opening of the street for use as soon as possible. Cement filler was used on all other brick work.

The Grand Rapids Railway Company laid new T rails in North Ionia street and West Leonard street with the exception of the north track west of Quarry street. The grooves for the wheel flanges on North Ionia street were formed with granite blocks and those on Leonard street by using a specially moulded rail block of the same material as the remainder of the brick.

Creosote wood block furnished by The Republic Chemical and Creosoting Company of Indianapolis were used in paving Fountain St. The blocks were three (3) inches thick, three (3) inches wide and from five (5) to eight (8) inches long. Barrett's bituminous cement filler was used.

South College avenue from Cherry to Wealthy was improved with macadam. The specifications for this work differed from previous work of this kind in that lime stone was mixed with the crushed granite, or boulders, in the proportion of one part of the former to fifteen parts of the latter. This proved to be a very good mixture. The material was bonded together and made hard with much less rolling than if the lime stone has been omitted.

The new charter amendments place the maintenance of streets under the Board of Public Works, the Engineering Department having direct charge of the work.

A Hooke Asphalt repair plant was purchased late in the season and the worst holes in the asphalt pavements repaired before the season closed. It is expected that the cost of maintaining the asphalt pavements will be materially reduced in the future.

A system of accounts for future street repair has been outlined and forms for reports and accounts prepared. It is proposed to carry an account with each street as improved showing cost, materials, assessment, cost of repairs, monthly, for the year, and total to end of each year. In the future this should make a valuable record of the maintenance cost of various classes of improvements and, studied in connection with the traffic, should materially aid in determining the improvement best suited to varying conditions.

The work completed and the new work contracted for during the past year is shown in the following table:



INDIAN MILL CREEK FLOOD WORK

View from Alpine Avenue Looking West. Showing Work Completed.

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS.

WORK LEFT OVER FROM 1906. COMPLETED IN 1907.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	Width of Road- way	DIMENSIONS			COST		Amount paid on Contract	CONTRACTORS
			Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll		
S. Division.....	E. Fulton to Wealthy.....	42	2637	Old.	13003	\$25610 46	\$26211 00	.....	Albert Prange
Emma Ave.....	Lake Ave., south.....	20	563	1206	1315	5100 00	5290 00	.....	Chas. J. Carpenter
Stocking St.....	W. Bridge to Seventh	42	3067	5964	15116	30021 00	31846 00	.....	Leonard Schuelder

GRADED, GRAVELED AND GUTTERS PAVED.

Sigsbee.....	S. Fuller to Ethel.	26	1702	3523	.....	\$7970 00	\$6190 00	.....	Kloote & VanderVeen
N. Ionia.....	E. Bridge to Fairbanks.....	30	1700	3339	.....	7645 00	7995 00	.....	Richard Pickett
Briggs Ave.....	Grandville to Sheridan Aves.....	26	564	1122	.....	3290 00	2465 00	.....	Fred Gilner
Hughart Ave....	Grandville to Sheridan Aves.....	26	564	1123	.....	2285 00	2460 00	.....	Fred Gilner
Shamrock Place	..... ..	24	1438	2850	.....	7792 00	8077 00	.....	Richard Pickett
Hope Ave.	Fitzhugh to Carleton.....	26	1308	2532	.....	7473 00	7723 00	.....	Kloote & VanderVeen
Silas Ave.....	Lake to Hope.....	24	664	1318	.....	3545 00	3760 00	.....	Kloote & VanderVeen
Milton Ave .. .	Silas to Carleton.....	24	432	910	.....	2340 00	2465 00	.....	Kloote & VanderVeen
J. Ball P'k Blvd	W. Bridge to John Ball Park...	16 22	1291	4394	.....	7455 00	7780 00	.....	L. C. Hilding
Allen's Court...	Lake to Wealthy.....	18	412	858	.....	2100 00	2225 00	.....	Kloote & VanderVeen
Summer.....	W. Bridge to Shawmut.. ..	26 38	1589	3206	.....	6323 00	6563 00	.....	VanderVeen & Mossell
Bemis Ave.....	Wealthy Ave. to Sherman.....	26	1254	2622	..	6800 00	7006 00	.....	Kloote & VanderVeen
Logan.	S. Fuller to Rural....	26	2380	4712	..	12635 00	12860 00	...	Kloote & VanderVeen

WORK LET FROM APRIL 1, 1907 TO APRIL 1, 1908.
PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	DIMENSIONS			COST		Amount paid on Contract	CONTRACTORS
		Width of Road-way	Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll	
Bostwick	Lyon to Park.....	30	1019	Old	3590	\$3815 00	\$8030 00	Albert Prange
Carrier.....	Plainfield to College Aves.....	35	2622	5900	11356	23695 00	24445 00	Jas. McDermott
Division, S.....	Wealthy to Fifth Aves.....	42	2577	.....	12546	20440 00	21115 00	Chas. J. Carpenter
Fulton, W.....	Jefferson to Straight.....	42	979	.....	4916	10676 00	11236 00	Chas. J. Carpenter
Fulton Alley	Division to Sheldon.....	20	242	.....	514	1210 00	1300 00	Jas. McDermott
Ionia, N.....	Crescent Ave. to E. Bridge.....	38	524	1048	2555	4649 00	4834 00	Albert Prange
Ionia, N.....	Monroe to E. Fulton.....	38	482	.....	2615	5000 00	5284 00	Jas. McDermott
Kent.....	Lyon to Crescent Ave.....	38	485	.....	2081	3875 00	4025 00	Chas. J. Carpenter
LaGrave.....	E. Fulton to Wealthy Ave.. ..	30 } 38 }	2583	4920	9800	19010 00	19535 00	Kloote & VanderVeen
Leonard, W....	River to Fremont	42 } 44 }	4304	6124	21198	47408 00	48783 00	Thos. McDermott
Ottawa, N.....	Monroe to Louis.	38	330	.....	1526	3647 00	3827 00	Albert Prange
Ottawa, S.....	E. Fulton to Island.....	38	314	.....	1298	3068 00	3308 00	Albert Prange

PAVED WITH CREOSOTED WOOD BLOCKS.

Fountain	N. Lafayette to N. Union.....	26	1862	Old	4990	\$14032 00	\$14270 00	Chas. J. Carpenter.. ...
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CONCRETE.

Wellingt'n Place	S. East to Buckeye.....	18	506	1320	\$2053 00	\$2243 00	Kloote & VanderVeen
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NOT COMPLETED.

Portsmouth.....	E. Fulton to Fountain	17.5	767	1540	\$2780 00	Kloote & VanderVeen
Terrace								

GRADED, GRAVELED AND GUTTERS PAVED.

STREETS	EXTENT	Width of Road-way	DIMENSIONS			COST		Amount Paid on Contract	CONTRACTORS
			Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll		
Carrier	N. College to N. Union.....	26	597	1212	.....	\$2763 00	\$2963 00	.. . . .	Jas. B. Hoey
Frances Ave . . .	Griggs to Burton Aves	26	1292	2657	.....	7371 00	7666 00	.....	Kloote & VanderVeen
Paddock	Lake Ave. to Hermitage..	24	435	926	.....	1690 00	1820 00	.....	Kloote & VanderVeen

NOT COMPLETED.

Alexander Ave .	S. East to Giddings Ave	26	3861	7791	.....	\$22475 00	\$23050 00	.....	Kloote & VanderVeen
Baraga.....	N. Diamond to Houseman.....	26	596	1278	.....	4082 00	4382 00	.....	Albert Prange
Dunham.....	Dolbee to Fuller.....	26	1617	3362	.....	6945 00	7145 00	.....	Kloote & VanderVeen
Gertrude.....	(Benjamin Terrace).....	24	833	.....	.....	.....	.....	.....	Thomas Benjamin
Griggs Ave.....	Division to Jefferson.	24	889	1908	.....	5630 00	5920 00	.....	Fred Gilner
Hilton.....	Prescott to Fifth Ave	26	2034	8734	.....	8290 00	8690 00	.....	VanderVeen & Mossell
New.	Second to Fourth Aves.	26	617	1367	.....	4459 00	4774 00	.....	Jas. B. Hoey
Phillips.....	Hall to Stevens.....	30	1108	2238	.....	5982 00	5482 00	.....	Wm. T. Johnston
Scott Ave.....	W. Bridge to Oswego.	24	1800	1677	.....	5365 00	5635 00	.....	Leonard C. Hilding

MACADAM.

College Ave., S.	Cherry to Wealthy.	30	1253	2506	\$7905 00	\$8180 00	Kloote & VanderVeen
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MEDINA BLOCKS AND BRICK—NOT COMPLETED.

E. Bridge. . . .	Ottawa to Barclay.....	1679	Old	\$26300 00	Kloote & VanderVeen
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MILEAGE OF STREETS.

The mileage of streets in the City, and the length of each class of improvements are shown in the following table:

Graded and paved with sheet asphalt.....	5.588
“ “ “ “ block asphalt on gravel.....	1.215
“ “ “ “ “ “ “ concrete.....	.230
“ “ “ “ creosoted wood blocks on concrete.....	.350
“ “ “ “ brick on concrete.....	17.540
“ “ macadamized	6.509
“ “ paved with tar concrete.....	.102
“ “ “ “ cedar blocks on concrete.....	1.881
“ “ “ “ “ “ “ gravel.....	.628
“ “ “ “ Medina stone blocks on concrete.....	.256
“ “ “ “ Portland cement concrete.....	1.083
“ “ “ “ cobble stones on gravel.....	.566
“ graveled and gutters paved with cobble stones.....	79.977
“ “ “ “ “ “ “ brick and concrete.....	36.666
“ and graveled.....	29.090
Unimproved	112.624
Total.....	294.285

ROAD ROLLERS.

The road rollers began work April 4th and ended December 4th. The No. 5 roller which had been used on flood work, running crusher was given a thorough overhauling and was equipped with a steam steering device. It began work July 1st. This additional roller was a great help in expediting the work on the gravel improvements.

Rollers No. 1, 2, 3 and 5 have been given the customary overhauling during the winter, and are in good condition for the seasons work. The No. 4 roller has not been repaired. On examination it was found that it would cost several hundred dollars to put this roller in good running order, and it was recommended that the roller be turned in as part payment on a new roller of the same type. This matter is still unsettled but it is

hoped that a decision will soon be reached as the No. 4 roller is not in condition to do the work required of it.

The receipts and expenditures for the past year, with the detail expenditures for each roller follows:

CONDITION OF ROAD ROLLER FUND MARCH 31, 1908.

	Receipts	Disbursements
Balance in fund March 31, 1907.....	\$ 955 68	
Kelley No. 1 Roller.....	109 00	\$ 1832 53
Kelley No. 2 ".....	363 90	1537 40
Russell ".....	13 50	1307 68
No. 4 ".....	553 00	1461 83
No. 5 ".....	300 00	975 49
New ".....		82 87
Receipts for rolling on improvements and sewers.....	10196 00	
Stock.....	11 00	170 12
Traveling expenses.....		15 85
Express, cartage and telegrams.....		2 98
	<u>\$ 12501 18</u>	<u>\$ 7386 75</u>
	7386 75	
Balance in fund March 31, 1908.....	\$ 5114 43	
Accounts receivable on hand March 31, 1908.....		\$ 182 50

ITEMIZED DISBURSEMENT.

KELLEY No. 1 ROLLER

Maintenance—	Labor-Shop.....	\$ 240 75
	Labor-Engineering.....	17 95
	Repair parts.....	263 07
	Painting.....	3 20
	Phone.....	1 80
	Insurance.....	30 00
	Wagon repair.....	21 13
Operation—	Labor-running.....	810 95
	Labor-cleaning.....	45 50
	Tools.....	5 26
	Coal.....	336 33
	Kindling.....	91 20
	Oil.....	17 04
	Waste.....	3 33
	Cartage.....	3 68
	Grease, lanterns, etc.....	8 63
	Livery.....	3 71
		<u>\$ 1832 53</u>

KELLEY No. 2 ROLLER.

Maintenance—	Labor-Shop.....	\$ 159 59
	Labor-Engineering.....	18 80
	Repair parts.....	125 16
	Painting.....	2 95
	Phone.....	1 80
	Insurance.....	30 00
	Wagon repair.....	25 75
Operation—	Labor-moving.....	4 61
	Labor-running.....	721 85
	Labor-cleaning.....	52 65
	Tools.....	98
	Coal.....	352 86
	Kindling.....	20 40
	Oil.....	5 84
	Waste.....	4 33
	Grease, lanterns, etc.....	6 03
	Cartage.....	80
	Livery.....	3 71
		<u>\$ 1537 40</u>

RUSSELL ROLLER.

Maintenance—	Labor-Shop.....	\$ 127 49
	Labor-Engineering.....	19 50
	Repair parts.....	29 54
	Painting.....	5 37
	Phone.....	1 80
	Insurance.....	30 00
	Wagon repair.....	16 23
	Boiler.....	29 05
	Curtain.....	4 08
Operation—	Labor-running.....	700 76
	Labor-cleaning.....	40 45
	Tools.....	36
	Coal.....	257 97
	Kindling.....	13 00
	Oil.....	5 52
	Waste.....	1 80
	Grease, lanterns, etc.....	9 67
	Cartage.....	1 78
	Livery.....	3 71
		<hr/>
		\$ 1307 68

No. 4 ROLLER.

Maintenance—	Labor Shop.....	\$ 164 71
	Labor-Engineering.....	19 90
	Repair parts.....	159 22
	Painting.....	5 38
	Phone.....	1 80
	Insurance.....	30 00
	Umbrellas.....	8 30
	Express.....	70
	Wagon repair.....	12 80
Operation—	Labor-moving.....	15 73
	Labor-running.....	730 79
	Labor-cleaning.....	54 75
	Tools.....	1 83
	Coal.....	210 47
	Kindling.....	14 80
	Oil.....	18 98
	Waste.....	3 89
	Cartage.....	1 84
	Grease, lanterns, etc.....	3 61
	Livery.....	3 71
	Damages.....	3 02
		<hr/>
		\$ 1461 83

No. 5 ROLLER.

Maintenance—	Labor-Shop.....	\$ 119 31
	Labor-Engineering.....	16 70
	Repair parts.....	113 86
	Painting.....	2 25
	Phone.....	1 20
	Insurance.....	30 00
	Hoe and coupling.....	5 08
	Hard brass.....	11 87
	Oil cans.....	1 24
	Express.....	25
Operation—	Labor-moving.....	3 37
	Labor running.....	470 68
	Labor-cleaning.....	17 00
	Tools.....	5 43
	Coal.....	152 37
	Kindling.....	9 20
	Oil.....	2 04
	Waste.....	2 68
	Livery.....	3 71
	Grease, lanterns, etc.....	7 25
		<hr/>
		\$ 975 49

NEW ROLLER.

Labor-Engineering	\$	60	00
Travelling expense.....		22	87
	\$	82	87

SEWERS.

Five year sewer bonds to the amount of \$15,000.00 were issued during the year.

Work on the West Side Ditch has progressed in a very slow and unsatisfactory manner. The work was completed to the north line of Eleventh Street when the work was stopped on December 24th for the winter. During February the National Construction Company were notified to resume operations. No response was received in reply to the notification and after the registered notices required by the contract had been sent to the National Construction Company and their bondsmen, the contract was declared void and bids for the completion of the contract were advertised for. The bids received were several thousand dollars above the detailed estimate and the work was ordered completed by day labor under the direction of the Engineer. This work has been started and will be pushed to an early completion.

Mr. Thos. J. Peter, Contractor for the South End Sewer System, has not progressed as rapidly as desired with his contract. A large amount of water was encountered on Stevens Street where the specifications require a water tight sewer. As this construction is very difficult under the conditions found, the work has progressed very slowly. The Contractor has purchased more pumps and a large boiler, and has employed a new superintendent who is familiar with this class of work. Mr. Peter has been notified that the work must be pushed to an early completion, work being carried on at more than one point on the main sewer if necessary. It is hoped that better progress will be made and the work completed before August 1st, when the extension of time granted by the Board expires.

Plans and specifications for the South Front Street Sewer from Allen Street to Wealthy Avenue have been completed and bids will be received April 9th, 1908. Plans for the East Side Trunk Sewer are partially prepared and will be completed by the time the right of way is secured.

The table following gives the sewers constructed and contracted for during the year.

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING MARCH 31, 1908.

The table following gives the kind and cost of sewers constructed during the year.

[illegible]

SEWERS CONSTRUCTED—Continued.

Scott Ave ..	W. Bridge, south	18	354	1	\$975 00	\$1108 00	Leonard C. Hilding
Second Ave	Oakland Ave., east	8	465	1	1825 00	1985 00	James B. Hoey
New ..	Second to Fourth Avenues ..	8	180	1	.....	.....	.....
Seventh	Alpine to Walker Avenues ..	15	445	1	1925 00	2090 00	John J. Rens
Shawmut Ave.	Ditch to John Ball Park	33	443	1	5398 00	5715 00	John VanEss
Straight and Hemlock, Sweet ..	N Colt to Plainfield	36	372	1	785 00	830 00	VanderWeele Bros.
Terrace Ave. ....	.....	39	548	1	746 00	880 00	Peter DeWitt
Union, N.	Spencer Ave., north	12	371	1	1681 00	1806 00	John VanderWeele
College Ave., north ..	West from Union	12	800	1	.....	.....	.....
Golf Grd Settlement ..	East from Union	12	817	1	4460 00	4885 00	John VanEss
Golf Grd Settlement ..	W. Broadway to Lane ..	12	576	1	.....	.....	.....
Veto .....	.....	12	800	1	434 00	498 00	John J. Rens
	.....	12	162	1	.....	.....	.....

The above noted sewer work will increase the system 4.593 miles. The total mileage of sewers in the city is given below:

Combined	139,548
Sanitary	14,696
Storm	13,410
Composed of the following:	
Brick	22,071
Vitrified pipe	196,162
Cement pipe	100
Wrought iron pipe	160
Cast iron pipe	224
Concrete sewer	8,681
Concrete block	384

Total

In connection with this system there are 2,903 manholes.

FLOOD WORK.

Early in the year detailed surveys giving cross-sections of the river, river banks, and buildings were made for the purpose of securing information in connection with flood protection plans, and establishment of dock lines where not established heretofore. These were completed during the summer. The question of establishing dock lines was taken up, and considerable controversy arose with various property owners as to the lines proposed to be adopted. At the request of some of these property owners, Mr. Lyman E. Cooley was again retained to go over the flood proposition, considering the new information secured since his previous report, and to make recommendations as to dock lines on the flood protection plan as outlined by this department. This report was submitted August 20, 1907, and printed in pamphlet form for general distribution.

The work of flood protection has since been pushed as rapidly as the securing of necessary rights of way would permit. Plans have been completed for considerable work that has not been contracted for awaiting only the securing of such rights of way.

GRAND RIVER—NORTH END.

Very little work was done this year by day labor on the river. Work was practically suspended after the high water of April, 1907. Wall and embankment was completed from the Grand Trunk Railway south to near Crosby Street, with the exception of some clearing out in the river, and the filling in of the driveway at Myrtle Street.

Under date of August 15, 1907, contract No. 1 was awarded to G. W. Bunker & Company for concrete wall and rock excavation where rights of way had been secured from about 300 feet south of Leonard Street to Eleventh Street. This also included two cut-off walls to Front Street. The lower cut-off wall was not built as rights of way farther south were later secured. About one-fourth of this contract has been completed.

Later rights of way were secured south to the water power dam on the west side of the river. This was divided into three contracts of which G. W. Bunker & Company secured No. 2 and No. 3 extending from Eleventh Street south to Sixth Street. These contracts were awarded on October 24, 1907.

Mr. Joseph Rusche was awarded the contract for No. 4 on January 30, 1908, which covers the work to the power dam. No rock excavation in the river bed was included in the last three contracts.

During the winter the contract was awarded for constructing an embankment and dock line wall on the east side of the river opposite the City Market south to the Pere Marquette Railroad bridge. This contract was awarded to Mr. Albert Prange on January 30, 1908. About one-third of this contract has been completed

Work on Indian Mill Creek was continued, and practically all completed by the latter part of September.

Outside of these larger contracts there was constructed a revetment wall on Silver Creek, and contract was let for moving superstructure of of dog pound made necessary by the construction of the dock line wall. The foundations for this dog pound were rebuilt by day labor. There has also been contracted for the building of a culvert at Fuller Street over Carrier Creek.

The expense of the various parts of this work is shown in the following details. Also the statement of the cost of flood work to date for the various years.

DETAIL.

GRAND RIVER—NORTH END—ITEMIZED EXPENDITURE.

	Equipment and Installation	Labor and Material
Superintendence and general expenses.....		\$ 472 73
Eng'neering and transportation.....		15 95
Cofferdams		35 70
Pumping.....	\$ 91 36	460 23
Quarrying—Air compressor.....	3 00	16 00
—Drills and piping.....	2 00	8 05
—Tools, carts, etc.....	17 70	
—Blasting.....		36 40
Crushing, crusher, engine and bins.....	14 69	824 41
Storage—Stone crushed.....		20 00
Wall—Excavation.....		871 39
—Concrete in place.....		2,079 22
Selling		261 33
Widdicomb embankment and raising track.....		4,473 82
Widdicomb work.....		84 02
Miscellaneous		1 25
Transfers.....		12 39
Storage labor.....		1 46
Derrick material.....		54 25
Flood Relief No. 1.....		1,089 04
	\$128 75	\$10,817 64
		128 75
		\$10,946 39

BUNKER'S CONTRACT No. 1.

Payment on contract.....	\$17,930 50
Deductions.....	580 36
Engineering	190 00
Car fare.....	3 10
Inspection	258 85
Hydraulic main—labor.....	7 33
Air compressor—stack.....	64 29
Material—inspection	9 04
Railing at Myrtle Street.....	3 45
Sewer outlet.....	61 03
Rent of shed	6 00
Livery	1 50

\$19,115 35

BUNKER'S CONTRACT No. 2.

Payments on contract.....	\$14,597 00
Engineering	314 00
Car fare.....	5 65
Inspection	187 58
Sewer pipe.....	17 22
Rent of row boat.....	1 00
Advertising.....	7 01
Material—inspection	5 02
Channels for gate.....	20 00
Platform steel.....	18 00
Level book.....	50
Blue prints.....	40
Livery	1 50

\$15,074 83

BUNKER'S CONTRACT No. 3.

Payments on contract.....	\$ 4,704 00
Engineering	134 00
Car fare.....	2 75
Inspection	68 83
Advertising.....	7 02
Material inspection.....	5 02
Blue prints	60
Livery	1 50
Iron cap.....	34

\$ 4,924 06

FLOOD WORK -PLANT ACCOUNT.

Cartage	\$ 8 30
Express.....	70
Leather belt.....	1 13
Boiler grates	8 11
Bolts.....	2 40
Crusher caps	2 10

\$ 22 73

RUSCHE'S CONTRACT No. 4

Engineering	\$ 86 00
Car fare.....	1 15
Advertising.....	15 22

\$ 102 37

PRANGE'S CONTRACT No. 5.

Deductions.....	\$ 39 58
Engineering	264 00
Car fare.....	3 15
Blue prints	45
Advertising.....	7 33
Livery	13 50
Lumber.....	17 45

\$ 345 46

SILVER CREEK REVETMENT WALL.

Payments on contract.....	\$ 1,420 00
Engineering.....	49 00
Care fare	1 40
Advertising.....	8 82
Inspection	83 62
Livery	50

\$ 1,563 34

DOG POUND FOUNDATION.

Labor	\$ 315 34
Cement	175 60
Gravel	110 50
Lumber.....	17 22
Engineering	8 00
Car fare.....	45
Tarred felt.....	1 33
Two cords wood.....	7 00

\$ 635 44

FULLER STREET CULVERT.

Engineering.....	\$ 23 00
Advertising.....	11 79

\$ 34 79

INDIAN MILL CREEK—ALPINE.

	Equipment and Installation	Labor and Material
Superintendence and general expenses.....		\$ 3,486 51
Engineering and transportation.....		308 60
Sheathing trenches		147 92
Pumping.....	\$437 92	1,115 50
Walls and abutments—excavation		16,142 18
Walls and abutments—concrete mixing.....	189 43	15,577 56
Watchman		42 75
Miscellaneous		10 67
Rail		25 00
Grade		44 08
Piles		191 36
Bridge—labor.....		1,134 63
—material.....		583 35
Derrick—labor.....		368 48
—material.....		372 06
Malleable Iron Works hole		102 33
Connecting Fuller & Rice.....		906 58
Alpine drain.....		145 96
Concrete railroad.....		175 91
Longfellow and Skillman lot filling		315 63
	\$627 85	\$41,196 01
		627 35

\$41,823 36

INDIAN MILL CREEK—BROADWAY.

Superintendence and general expenses.....		\$ 1 40
Engineering and transportation.....		42 70
Pumping	\$ 15 00	58 13
Walls and abutments—excavation.....		68 59
—concrete mixing		15 37
Watchman		8 00
Rail		28 90
Gunn Furniture Co.—main.....		196 02
—sewer.....		65 86
Bridge—labor.....		740 25
—material.....		696 84
—rolling.....		51 00
—sidewalk		58 77
	\$ 15 00	\$ 2,031 83
		15 00
		\$ 2,046 83

FLOOD PROTECTION—MISCELLANEOUS.

Land for S Front street pumping station.....	\$ 475 00
Motor for West Side Ditch pumping station.....	521 30
Tearing out Grand Trunk piers—inspection ..	36 57
Test holes—engineering.....	311 00
—car fare ..	17 60
—labor ..	493 26
Labor at Ann Street boom (transfer).....	18 26
General—engineering.....	117 00
—car fare ..	25
—blue prints.....	10 13
—transit rent.....	5 00
—telegrams ..	1 02
—advertising.....	58 80
—boat rent ..	10 90
—cartage ..	2 95
	<hr/>
	\$2,079 04

FLOOD PREVENTION CARRIED BY GENERAL FUND AND PAID BACK TO
GENERAL FUND JANUARY 9, 1908.

Labor.....	\$ 985 93
Books.....	4 00
Blanks (printing) ..	12 00
Cooley's reports (printing)....	37 50
Traveling expenses.....	3 10
Livery ..	6 50
Expert services (Cooley) ..	1,396 00
Grand Trunk Bridge—slab excavation ..	898 75
Advertising.....	183 19
Lumber.....	62 90
Stack (air plant).....	37 50
Option—land.....	25 00
Gravel ..	21 00
Grade stakes.....	16 00
Cement.....	3 80
Supplies ..	3 73
Oars.....	2 80
Wire ..	1 70
Teaming ..	2 00
Boat hire ..	50
Express.....	60
Freight ..	33
Transit hire.....	5 00
	<hr/>
	\$,709 2

COST OF FLOOD WORK—SUMMARY MARCH 31, 1908.

	Fiscal Year 1904-5	Fiscal Year 1905-6	Fiscal Year 1906-7	Fiscal Year 1907-8	Total
Flood relief, No. 1.....			\$ 1,992 11	\$ 1,089 04	\$ 3,081 15
Widdicomb embankment ...	\$ 9,882 13	\$ 4 60	2,087 61	4,473 82	16,448 16
Grand River—north end.....		28,331 27	58,293 44	5,383 53	92,008 24
Indian Mill Creek—Alpine ...			23,213 27	41,823 36	65 036 63
—Broadway			13,336 69	2,046 83	15,383 42
--Contract.. ..		3,005 38	2,787 96	....	5,793 29
Turner Street Bridge.....		5,369 70	1,024 85	.....	6,394 55
G. W. Bunker's Contracts No. 1, 2 and 3				39,136 96	39,136 96
J. P. Rusche's Contract No. 4				102 37	102 37
Albert Prange's Contract No. 5				345 46	345 46
Dog pound.....				568 89	568 89
Protection				7,776 32	7,776 32
Silver Creek revetment				1,563 34	1,563 34
Fuller Street culvert.....				34 79	34 79
Flood prevention (general)...				3,709 83	3,709 83
Receipts and credits.....	\$ 9,882 13	\$ 36,710 90 758 19	\$102,735 83 15,931 16	\$108,054 54 8,087 11	\$257,383 40 24,726 46
	\$ 9,882 13	\$ 35,952 71	\$ 86,804 67	\$100,017 43	\$232,656 94

Accounts receivable on hand March 31, 1908.....	\$ 780 87
Accounts payable on hand March 31, 1908	3,172 53
The flood protection bond act provided the funds ordered from the sale of bonds may be used to reimburse the city for moneys used since January 1, 1906. On this basis there has been spent from the contingent fund.....	
Flood fund.....	\$ 12,314 01 220,342 93
Total.....	\$232,656 94

CONDITION OF FLOOD WORK FUND MARCH 31, 1908.

	Receipts	Disbursements
Overdraft March 31, 1907.....		\$ 5,014 73
Grand River—North End.....	\$ 1,978 21	10,946 39
Indian Mill Creek—Alpine.....	4,148 65	41,823 36
—Broadway.....	1,910 25	2,046 83
Bunker Contract, No. 1.....		19,115 35
Bunker Contract, No. 2.....		15,074 82
Bunker Contract, No. 3.....		4,924 06
Rusche Contract, No. 4.....		102 37
Prange Contract No. 5.....		345 46
Dog pound foundation.....		635 44
Protection.....		2,079 04
Fuller Street culvert.....		34 79
Silver Creek revetment wall.....		1,563 34
Sale of bonds.....	250 000 00	
Temporary loan from Ann Street bridge fund.....	10,000 00	
Return of loan to general fund Jan. 9, 1908.....		53,709 83*
Return of loan to contingent fund Jan. 9, 1908.....		43,867 67*
Return of loan to Ann Street bridge fund Jan. 9, 1908....		10,000 00
Interest on bonds		5,630 63
Plant account		22 73
	\$ 268,037 11	\$ 216,936 84
	216,936 84	
Balance in fund March 31, 1908.....	\$ 51,100 27	

*The estimates for the Flood Work Bond issue did not include the work previously done and paid from the Contingent and General Fund. Since the sale of the \$250,000 00 bonds, \$97,577 50 has been transferred from the Flood Work Fund to the Contingent and General Funds as shown above.

TEMPORARY FLOOD WORK.

During the year, especially at the time of high water in March, considerable temporary flood work was cared for, statement of the cost of which is hereto attached. This includes a few bills for the work on Grand River the preceding year.

The work consists largely in operating the pumping stations at Front Street and Blumrich Avenue, and also at the West Side ditch.

At the urgent request of various property owners along the river, a boom was placed at Ann Street early in the year. The first movement of ice, as was predicted, forced the boom against the false work of the Company erecting the superstructure of Ann Street bridge. This caused the city considerable damage to replace their false work. A boom at this point will give very little satisfaction without a large number of cribs in the river on which to fasten the boom. The pressure of ice soon lifts the boom permitting the ice to pass under.

EXPENDITURES FROM FLOOD RELIEF FUND No. 2.

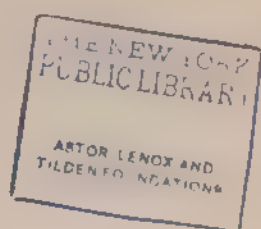
DISBURSEMENTS.

Labor	\$ 353 37
Cartage.....	9 15
Ladder.....	2 50
Livery.....	4 30
Taking out boom and cable at Ann Street bridge.....	25 00
Damage by boom to Ann Street bridge piers.....	57 45
Sacks	70 64
Hooks and bolts for boom.....	2 06
Staples.....	13 00
Boat rent	50
Saw repairs.....	1 50
Dynamite.....	9 30
Fuses.....	15 25
Pulley.....	6 50
Motor repairs.....	7 01
Bolts	96
Tearing out sluice in dam during ice jam.....	11 00
Ice saws	33 00
Repair shop, machine work.....	2 18
Pumping.....	142 30
Lumber	57 93
Preparation (sand bags).....	283 46
Engineering	59 00
Car fare.....	1 00
(Grand Haven) blasting machine.....	34 97
Telephone (Grand Haven).....	10 40
Telegram (Grand Haven).....	1 02
Oil Heater (Grand Haven)	3 85
Galvanized Bolters.....	4 75
	<hr/>
	\$1,724 15
Unexpended balance of Grand Haven ice jam appropriation placed in Flood Rel. No. 2 fund April 13, 1907.....	1,466 82
	<hr/>
Overdraft March 31, 1908	\$ 257 33



INDIAN MILL CREEK FLOOD WORK

**View Looking West from near Grand Rapids Malleable Iron Works.
Excavation Nearly Completed.**



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ASTOR LENOX AND
TILDEN FOUNDATIONS

TABULATION SHOWING GAGE READINGS

FROM APRIL 1, 1907 TO MARCH 31, 1908.

Day	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan'y	Feb'y	March	Day
1	8.30	5.55	2.40	.15	.10	Sunday	.75		Sunday	5.35	2.50	Sunday	1
2	8.25	5.87	Sunday	.05	.13	Holiday	.75		.15	5.00	Sunday	4.10	2
3	7.65	7.65	1.80	.05	.05	.15	.85		.42	4.80	2.75	3.40	3
4	8.60	8.05	1.00	.13	Sunday	.10	1.10		.02	Omitted	2.85	3.00	4
5	5.80	Sunday	1.75	.15	.30	.17	.85		.17	Sunday	2.85	3.35	5
6	4.45	7.57	1.70	.20	.30	.35	Sunday		.05	3.00	2.15	3.65	6
7	Sunday	6.55	1.80	Sunday	.30	.80	.55		.07	2.43	2.35	7.27	7
8	3.05	4.96	1.52	.12	.30	Sunday	.90		Sunday	2.33	2.33	Sunday	8
9	4.00	5.12	Sunday	.15	.10	.37	.65		.10	2.72	2.00	9.05	9
10	2.75	4.30	1.45	.25	.32	.15	.45		1.10	2.84	2.00	9.90	10
11	2.95	3.99	1.45	.16	Sunday	.05	.30		1.05	2.30	1.87	11.67	11
12	2.85	Sunday	1.45	.12	.40	.09	.05		1.03	Sunday	9.05	12.80	12
13	2.30	2.00	1.35	.10	.38	.07	Sunday		1.75	9.05	9.50	14.33	13
14	Sunday	2.90	1.30	Sunday	.40	.30	.40		.05	1.00	4.75	14.90	14
15	2.05	1.25	Sunday	.15	.45	Sunday	.05		Sunday	1.30	Omitted	Sunday	15
16	2.10	2.30	Sunday	.67	.27	.40	.05		.45	1.15	Bunday	15.30	16
17	2.05	2.15	0.95	.45	.35	.05	.30		.90	1.15	5.55	14.92	17
18	2.02	2.00	.77	.77	Sunday	.30	.05		.83	1.05	6.05	13.95	18
19	2.90	Sunday	.95	.15	.37	.55	.35		1.18	Sunday	6.50	12.90	19
20	2.55	1.70	.37	.10	.35	.55	Sunday		.95	1.00	6.40	11.90	20
21	Sunday	1.77	.90	Sunday	.35	.10	.10		.75	1.27	6.30	10.50	21
22	2.43	1.77	1.00	.28	.10	Sunday	.05		.95	1.30	Holiday	Sunday	22
23	2.32	1.70	Sunday	.27	.35	.05	.05		.93	1.10	Sunday	9.05	23
24	1.33	1.70	.57	2.30	.27	.17	.80		.50	.90	5.10	8.52	24
25	1.50	1.45	1.05	2.13	Sunday	.30	NO READINGS TAKEN		Holiday	1.00	4.95	7.65	25
26	1.77	Sunday	1.47	2.03	.40	.25	.80		.55	Sunday	4.90	7.13	26
27	1.90	1.90	1.75	1.70	.37	.35	.15		1.55	1.60	4.60	6.55	27
28	Sunday	2.70	1.50	Sunday	.40	.05	Sunday		2.30	1.75	4.60	7.40	28
29	1.90	2.92	1.10	.43	.37	Sunday	.40		Sunday	1.75	4.23	Sunday	29
30	3.07	2.65	Sunday	.35	.45	.....	.....		4.95	1.72	.....	9.10	30
31	.....	2.50	.....	.27	.50	.....	.....		5.10	1.50	.....	10.00	31

NO READINGS TAKEN - Piling in new gage

NO READINGS TAKEN

WATER WORKS.

A large 16 inch main was laid in Alexander Avenue from East to Fuller Street ahead of the improvement of the street, thence north in Fuller Street to the stand pipe. This later should be extended further west in Jones Street to connect with the large main in South Union Street.

The 20-inch main in Ottawa Street was extended from Louis Street south to Island Street connecting up several smaller mains, and giving better fire protection in that section.

The last section of 8 inch main in West Fulton Street west of Jefferson was removed and replaced with 12-inch.

The remainder of the pipes laid were 6-inch, 8 inch and 10-inch in diameter, and were laid ahead of improvements to give supply for various sections in need of water.

The following table gives the list of water mains laid during the past year, and is followed by a table showing the mains lowered and the streets in which services were lowered in connection with the improvements. Also a table showing the total number of miles of pipe, and the total number of miles of pipe in the Water Works system prior to April 1st, 1907 and the amount laid between April 1st, 1907, and April 1st, 1908 the amount removed during the latter period, and the total now in the system.

WATER MAINS.

STREET	EXTENT	Distance in feet from					DIAMETER IN INCHES							COST				
		E W N S					4	5	8	10	12	16	20	Material	Labor	Eng. & Inc.	Total	
		Street Line																
Leonard, E.	N. Union to Lewis.	25						16							673.48	323.80	57.58	1053.91
Sherman	Finch to Bernis Ave.	25						845							1549.20	673.71	84.35	2264.26
Baraga Ave.	Houseman to Diamond	25						840		500					245.10	245.10	25.13	534.74
Hodgson Place		26						345							260.67	119.82	15.10	396.59
Kochester Place	Jefferson Ave. east	6						295							236.89	115.87	14.65	367.17
Golf Grounds								1917							1460.71	710.65	40.90	2149.27
Sweet	N. Colt to Plainfield Ave.	25						643							444.08	232.29	30.63	707.60
Pleasant	S. Coles to Paris Ave.	25						347							203.96	128.31	14.97	411.12
Morris Ave.	Wentworth to Cherry	25						125							942.67	455.13	23.12	1435.94
Fernando	N. College to North Ave.	25						760							505.51	276.38	23.00	809.89
Gertrude	West by to Lake Ave.	22						912							671.90	240.63	23.80	1042.38
Innes Ave.	Grand Ave. to N. East	25						365							201.72	143.28	12.70	437.70
Fuller, S.	Alexander to Finch Ave.	25						87			1039				2337.24	737.79	101.67	2476.63
Dunham	Dolbes to S. Fuller	25						1059							1259.76	657.48	66.24	1983.48
Phillips	Stevens to Hall	25						465							559.76	144.34	22.59	726.69
New	Second to Fourth Ave.	25						700							693.17	245.00	17.87	955.07
Francis Ave.	Burton to Griggs Ave.	25						1071							1187.67	444.02	60.50	1692.19
Fulton W.	Jefferson to Straight	25						1405			300				757.82	190.67	59.87	908.36
Alexander Ave.	S. East to Gliddins Ave.	25						1070			3710				1976.45	677.34	54.34	2607.03
Second Ave.	Grandville av to Buchanan	25						1618							1976.45	677.34	54.34	2607.03
Terrace Ave.	Hall to Garden	25						975							642.76	441.04	54.48	1138.22
Horton Ave.	Burton to Griggs Ave.	25						1385							469.32	148.06	27.07	646.57
Burton Ave.	Buchanan St. east	25						281		250					214.93	122.00	15.78	353.51
Buchanan	Burton to Quigley Ave.	25						38					904		5754.92	125.16	61.59	6413.46
Broadway, W.	Earle to Butterworth Ave.	25						948							715.35	411.00	51.53	1178.94
Ottawa, W.	Is and to Louis	27						19	250						236.32	127.57	23.17	387.18
Scott Ave.	W. Bridge to Oswego	15						188							1059.95	637.13	60.88	1756.99
Walker Ave.	West to White	25													18.16	7.00	2.00	27.16
Crosby	West to Tamarac	25													21.66	7.00	2.00	30.66
Earle	Butterworth Ave.	16						438							296.41	113.96	25.79	437.75
Allen Court	Paris Ave. to S. East	20						1688							1044.69	683.92	109.90	1776.71
Oakdale Ave.	S. Fuller to Rural	25						551							1653.81	737.79	64.57	2744.97
Logan	Alexander Ave. to Fish	25													476.12	201.26	23.48	706.96
Gliddins Ave.		25													961.45	279.01	6.33	1246.78
Indiana	Chatham to W. Bridge	25																

WATER MAINS—Continued.

STREET	EXTENT	Distance in feet from Street Line	DIAMETER IN INCHES							COST		
			4	6	8	10	12	15	20	Material	Labor	Eng. & Ins.
Queen	Sweet to Colfax	25		425						\$ 425 M	\$ 103 15	\$ 8 26
Washington Place	Buckeye to S. East	25		19						99 50	19 70	4 13
Elmwood Place	Cherry, north	6	300							377 52	114 95	10 00
Grand Ave	Dist to Highland Park	20		600						487 56	202 56	17 80
Henry	Fifth Ave. south	25		168						156 16	63 45	4 06
Union N.	Spencer av to golf ground	25			594					656 76	225 31	18 78
Union Blvd.	Camden Ave to s. of P.M.	30		450						226 44	184 27	16 30
Lincoln	Railroad, north	20	96							51 47	31 85	3 76
Victoria	Broadway, east	20			200					254 09	171 53	8 16
Clude Park Ave.	Grandville Ave., south	25			400					556 38	254 43	22 94
Carrier	Plained Ave to Union	25								136 03	17 56	3 50
Bostwick	Lyon to Park	21		14	113					504 76	703 37	194 21
Buckeye	At Hollister	25								17 50	4 35	1 05
Division S	Westly to Fifth Ave	10		125	86					208 50	423 42	14 74
Arlington	Fifth Ave. north	15		227		7				251 24	90 83	1 30
LaGrave	Fulton to Wealthy Ave.	25		174		126				265 56	254 37	18 91
Broadway	Hamilton to Alpine Ave	20									1691 28	35 83
Alpine Ave.	North to Broadway	25								170 12	823 72	133 32
Leonard, W		25		559						634 06	384 56	24 37
Erle		25								12 72		
Bridge, W		25								12 92		
River Crossing		25								52 66	98 52	9 10
Cherry Alley	Buckeye, north	25		125					56	165 01	56 85	7 25
John Hall P's Blvd	W Bridge, south	25								22 45	0 86	
Bemis Ave		25								19 84	7 00	3 16
Fountain		25								23 26		
Lyon		25										
										\$43068 08	\$81451 05	\$ 2305 20
										\$ 67763 23		

WATER MAINS AND SERVICES LOWERED—MISCELLANEOUS MAINTENANCE.

STREET	SIZE	LENGTH	TOTAL	
Sweet Street	6 inch	144	\$ 43 20	Lowering and extending service Miscellaneous maintenance Miscellaneous Help on lowering hydrants
Wellington Place.....	244 17	
Clyde Park Avenue.....	42 21	
Carrier Street.....	6 inch	3,131	967 76	
Bostwick Street.....	8 inch	544	165 69	
Division Street.....	8 00	
LaGrave Street.....	1,451	542 91	
Goodrich Street.....	3 30	
West Leonard Street	257 31	
West Leonard Street.....	81 08	
College Avenue.....	95 92	Services
John Hall Park Boulevard.....	35 10	
Paddock Street.....	150	26 00	
Summer Street.....	138 68	
Fountain Street.....	670 83	
Fountain and Barclay Streets.....	18 12	
Griggs Avenue M	8 20	
Grandville Avenue and Lilley Street.....	1 28	
North Ionia Street	18 80	
Crescent Place	32 29	
Sweet Street.....	60 80	
			\$ 3,461 85	

MILES.

	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	24 in.	30 in.	36 in.	Hyd- rants	Valves
Prior to 1907	40 548	64 397	21,303	8,410	17,180	239	8,452	749	2,018	1,927	.585	.019	1574	1656
Laid in 1907 .....	.079	5,464	.376	.191	1,267	.....	.710	.....	.190	.....	.....	.....	84	133
Totals.	40 627	69,861	21,679	8,601	17,447	239	9,162	749	2,208	1,927	.585	.019	1658	1789
Removed .....	.213	.052	.830	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	40,414	69,809	21,349	8,601	17,447	239	9,162	749	2,208	1,927	.585	.019	1658	1789

Total Miles of Pipe—172.588

STANDPIPE.

As soon as the weather would permit, the steel tank on the standpipe was caulked and tested, the painting being completed in June.

The standpipe was placed in service soon after the summer sprinkling commenced, and very materially increased the pressure in the east end of the city at the time of greatest demand.

As soon as the new pump is installed, the old standpipe should be raised 20 feet, which would give a much needed increase in pressure on the high service.

The cost of the standpipe to date is included in the following statement:

ITEMS	Previous to Apr. 1, '06	April 1, '06 April 1, '07	April 1, '07 Mar. 31, '08	Total
Payments on masonry .....	.....	\$10,534 60	\$ 7,892 70	\$18,426 70
Payments on tank .....	.....	7,240 00	3,760 66	11,000 66
Connections .....	.....	676 73	.....	676 73
Land	\$ 508 67	250 00	.....	758 67
Engineering and inspection	88 69	368 57	966 82	1,424 08
Traveling expenses	70 25	.....	.....	70 25
Printing and advertising	113 41	.....	.....	113 41
Miscellaneous materials .....	.....	176 77	38 11	214 88
	\$ 776 02	\$19,246 07	\$12,658 31	\$32,640 40

INVENTORY OF WATER MAINS 1907.

1	2	3	4	5	6	7	8	9	10	11	12	REMARKS
Year	Original Cost	Removed	Remaining	%	Life	\$ for \$1.00 Compound n Years	Yearly Deposits (4) - (7)	Age	\$ for \$1.00 Compound n Years	Total Depreciation (8 x 10)	Remain'g Value (1) (11)	
1873	\$3,001.07	\$306.80	\$2,694.27	2 1/2	100	\$ 445.37	73.74	34	\$59.03	\$ 2,635.24	\$ 28,717.88	.....
1874	110,873.60	87,567.80	23,305.80		"	"	52.88	35	61.61	3,713.65	30,982.44	.....
1875	45,630.99	24,196.23	21,434.76		"	"	41.35	32	49.32	3,039.38	16,294.88	.....
1876	56,468.88	"	25,458.88		"	"	37.49	31	47.15	2,707.35	32,781.49	.....
1877	"	"	"		"	"	"	30	46.00	"	"	.....
1878	138.50	"	138.50		"	"	12	30	48.00	"	48.00	.....
1879	7,363.23	7,363.23	"		"	"	"	26	40.95	"	"	.....
1880	27,584.54	2,625.76	24,958.78		"	"	56.00	27	36.01	2,070.28	22,768.50	.....
1881	519.77	"	519.77		"	"	1.17	25	35.01	41.90	477.81	.....
1882	10,014.87	"	10,014.87		"	"	22.65	24	33.15	748.53	9,266.34	.....
1883	3,553.96	384.55	3,169.41		"	"	7.31	23	31.35	259.17	2,910.24	.....
1884	18,276.77	988.61	17,288.16		"	"	39.04	22	29.89	1,154.81	16,133.35	.....
1885	16,133.84	365.77	15,768.07		"	"	35.66	21	27.86	990.70	14,777.37	.....
1886	39,463.76	"	39,463.76		"	"	65.43	20	25.18	1,739.14	37,724.62	.....
1887	122,113.33	4,317.61	117,795.72		"	"	265.08	19	24.54	6,519.79	111,275.93	.....
1888	116,001.62	1,127.90	114,873.72		"	"	260.45	18	22.85	5,977.33	108,896.39	.....
1889	10,619.70	877.33	9,742.37		"	"	21.97	17	21.39	465.94	9,276.43	.....
1890	104,440.68	656.68	103,783.99		"	"	254.08	16	19.80	4,648.51	99,135.48	.....
1891	78,444.50	491.98	77,952.52		"	"	175.82	15	18.38	3,231.57	74,720.95	.....
1892	43,057.64	1,398.47	41,659.17		"	"	95.81	14	16.38	1,013.61	40,645.56	.....
1893	3,067.97	"	3,067.97		"	"	8.97	13	15.32	106.17	2,961.80	.....
1894	19,230.10	819.07	18,411.03		"	"	43.87	12	14.14	605.18	17,805.85	.....
1895	53,523.76	"	53,523.76		"	"	129.72	11	12.80	1,545.22	51,978.54	.....
1896	22,533.96	"	22,533.96		"	"	70.82	10	11.48	983.41	21,550.55	.....
1897	32,469.29	"	32,469.29		"	"	71.30	9	10.20	747.68	31,721.61	.....
1898	28,336.43	"	28,336.43		"	"	53.32	8	8.96	567.51	27,520.77	.....
1899	10,270.04	"	10,270.04		"	"	22.16	7	7.14	179.23	10,090.81	.....
1900	7,949.01	198.88	7,750.13		"	"	17.63	6	6.55	148.91	7,601.22	.....
1901	8,400.67	214.23	8,186.44		"	"	18.43	5	4.86	99.60	8,086.84	.....
1902	43,359.16	"	43,359.16		"	"	97.42	4	3.85	410.27	42,948.89	.....
1903	101,152.06	"	101,152.06		"	"	235.59	3	3.15	711.55	99,440.51	.....
1904	40,339.25	"	40,339.25		"	"	72.02	2	2.68	101.53	40,237.72	.....
1905	23,570.00	1,377.52	22,192.48		"	"	"	1	1.02	74.07	22,124.01	.....
1906	66,726.38	"	66,726.38		"	"	"	0	"	"	66,726.38	.....
1907	\$1,270,696.22	\$ 184,465	\$1,086,231.00		"	"	"	"	"	\$ 46,321.72	\$1,039,909.28	.....

Check (11) plus (12) equals (4). \$ 4,581.72
1,039,909.28
\$1,135,359.00

INVENTORY OF MACHINERY, 1907.

Year	COST		5	6	7	8	9	10	11	12	REMARKS
	Original	Removed									
1874	\$ 250.93	\$ 3.05	3 1/2	30	\$ 53.43	\$ 358.18	33	Over 30 yrs	\$ 19137.82		Over 30 years
1875	3943.52		..	..	..	73.81	32	Over 30 yrs	3.43		Over 30 years
1877	3398.66	345.66	..	..	..	..	..	..	..	..	..
1878	10,415.10		..	..	..	..	..	..	..	..	..
1879	1030.41		..	..	..	196.61	29	50.62	9962.40	\$ 552.70	..
1880	341.14		..	..	..	30.33	28	47.91	974.01	112.44	..
1887	176.69		..	..	..	1.52	21	31.83	47.62	38.38	..
1888	15240.05	7941.06	..	..	..	87	20	29.27	25.46	21.04	..
1889	13,567.58	1,9853.11	..	..	..	136.60	19	21.28	8726.45	3572.54	..
1890	8,013.76	2,419.54	..	..	..	32.84	18	25.56	832.49	921.96	..
1891	3,587.12		..	..	..	28.90	17	23.50	679.16	865.07	..
1892	3817.70		..	..	..	6.99	16	21.70	18231.83	19362.29	..
1893	2152.71		..	..	..	62.92	15	14.97	2339.77	20775.98	..
1894	4,405.26		..	..	..	40.29	14	18.30	737.31	1415.40	..
1895	39.61		..	..	..	79.86	13	16.68	1331.90	2834.36	..
1896	4,072.50		..	..	..	74.43	12	15.11	11187.91	22373.19	..
1897	902.81		..	..	..	88.11	11	13.60	1198.30	3549.20	..
1898	203.60		..	..	..	16.99	10	12.14	216.25	701.56	..
1899	1500.00		..	..	..	4.52	7	8.05	39.60	224.10	..
1900	350.00		..	..	..	26.08	6	6.78	190.38	1309.62	..
1901	1267.61		..	..	..	65.51	5	5.55	363.58	3136.42	..
1902	1267.61		..	..	..	23.53	4	4.36	103.59	1155.03	..
1903	1415.00	Shop	..	..	..	67.67	4	4.36	294.04	3220.96	..
1904	143.25	Station	..	..	..	2.64	3	3.22	18.43	131.62	..
1905	2649.31		..	..	..	49.58	2	1.1	104.61	2514.70	..
1907	2741.04		..	..	..	..	0	..	..	2741.04	..
	\$ 25001.05	\$ 3145.99							\$ 80719.61	\$ 97707.45	

Check (1) plus (12) equals (4) \$ 80719.61
97707.45
\$ 178427.06

INVENTORY OF STANDPIPE , MAY 1908.

1 Year	2 3 4 COST				5	6 %	7 Life n'	8 S for \$1.00 compoun'd % years	9 Yearly deposi- (5) :- (8)	10 age n'	11 S' for \$1.00 compoun'd n' years	12 Total depreciat'n (9) x (11)	13 Remaining value (5) — (12)	14 REMARKS
	ORIGINAL COST		Removed	Remaining										
	Land	Structural												
1888	\$ 576 00	.....	.....	\$ 576 00	.....	3 1/2	30	\$ 53 43	\$ 219 82	19	\$ 27 28	\$ 5996 6	\$ 576 00	.....
1888	.....	\$ 11745 40	.....	11745 40	.....	3 1/2	30	\$ 53 43	\$ 219 82	19	\$ 27 28	\$ 5996 6	5745 71	.....
1903	556 28	.....	\$ 52 61	503 67	.....	.....	.....	.....	.....	.....	.....	.....	503 67	.....
1906	.....	272 35	.....	272 35	.....	3 1/2	50	135 58	2 01	3	2 11	4 24	268 11	.....
1906	250 00	.....	.....	250 00	.....	.....	.....	.....	.....	.....	.....	.....	250 00	.....
1906	.....	18996 07	.....	18996 07	.....	3 1/2	50	135 58	140 11	1	1 03	144 31	18851 76	.....
1907	.....	12654 31	.....	12654 31	.....	3 1/2	50	135 58	93 36	0	.....	.....	12654 31	.....
	\$1382 28	\$ 43672 13	\$ 52 61	\$ 45001 80								\$ 6145 24	\$ 38856 56	

Check equals (12) plus (13) equals (5) \$ 6145 24
38856 56

INVENTORY OF RESERVOIRS, 1907.

1874	\$25050 00	.....	.....	\$ 25050 00	3	50	.....	.....	33	.....	.....	\$ 25050 00	.....
1874	.....	\$ 58654 71	.....	58654 71	.....	.....	.....	.....	.....	.....	.....	30014 01	.....
1876	.....	24508 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1876	.....	4046 66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1877	.....	124 94	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	.....	45 00	.....	45 00	.....	.....	.....	.....	6	6 66	2 60	42 40	.....
1903	.....	880 85	.....	880 85	.....	.....	.....	7 58	4	4 80	32 59	848 26	.....
	\$25050 00	\$ 88280 66	28700 10	\$ 84630 56							\$ 28675 89	\$ 55954 67	

Check equals (12) plus (13) equals (5) \$28675 89
55954 67
84630 56

INVENTORY OF PUMPING STATION, 1907.

Year	COST					%	Life n	S' for \$1.00 Compounded n Years	Age n	S' for \$1.00 Compounded n Years	Total Depreciation (b) x (11)	Remaining Value (b)-(12)
	ORIGINAL COST		Removed	Remaining								
	Land	Structural										
1874	\$5,000 00			\$ 5,000 00	3%	50	\$118 18		53	\$66 71	\$ 10,835 29	\$ 5,000 00
1875		\$22,452 70	\$ 231 30	22,231 31	"	"	"		32	54 09	648 36	11,376 02
1876		1,599 11	20 00	1,619 11	"	"	"		31	51 50	516 55	972 70
1877		1,164 56		1,164 56	"	"	"		30	49 00	23 90	648 09
1878		70 95		70 95	"	"	"		29	46 57	38 06	41 00
1879		82 50		82 50	"	"	"		28	44 22	189 96	49 44
1880		497 44		497 44	"	"	"		27	41 93	14 36	308 18
1881		29 79		29 79	"	"	"		26	39 71	7 15	25 54
1882		21 12		21 12	"	"	"		25	37 45	13 97	25 54
1883		156 25		156 25	"	"	"		24	35 80	26 80	99 45
1884		2,007 03		2,007 03	"	"	"		23	34 57	647 27	2,380 35
1885		516 59		516 59	"	"	"		22	33 87	409 90	2,380 35
1886		98 05		98 05	"	"	"		21	32 41	107 09	76 13
1887		5,392 94		5,392 94	"	"	"		20	30 76	948 02	4,344 92
1888		16,595 19		16,595 19	"	"	"		19	29 15	2,725 29	13,869 91
1889		10,738 52		10,738 52	"	"	"		18	27 60	1,639 77	9,111 75
1890		439 75		439 75	"	"	"		17	26 09	67 90	411 85
1891		508 99		508 99	"	"	"		16	24 62	119 28	487 35
1892		1,173 76		1,173 76	"	"	"		15	23 01	119 28	1,054 45
1893		15 40		15 40	"	"	"		14	21 38	1 39	15 18
1894		357 05		357 05	"	"	"		13	20 06	2 36	354 69
1895		128 30		128 30	"	"	"		12	18 89	2 36	126 94
	\$5,000 00	\$95,315 26	\$ 231 30	\$95,083 97							\$ 18,005 29	\$ 51,041 61

Check (12) plus (13) equals (5) \$ 18,205 29
 51,041 61

 \$ 69,246 87

INVENTORY OF INTAKES

1	2	3		4	5	6	7	8	9	10	11	12	13	14
		COST												
		ORIGINAL COST	REMOVED											
a'	Land	Structural	Remaining										Remaining value (b) (12)	REMARKS
1887		\$ 4284 28	\$4384 98		3%		30	\$ 53 43			30			
1888		2714 92	2714 92		"		"	"	\$ 38 37	19	35 35	\$ 998 03	\$ 11 5 65	
1889		15935 58	17714 92		"		"	"	50 12	17	53 67	707 82	901 41	
1890		1619 23	1604 28		"		"	"	38 64	15	19 97	779 43	1304 07	
1891		2083 80	2068 80		"		"	"	32 53	14	18 30	506 48	1143 20	
1892		1738 87	1738 87		"		"	"	15 69	13	14 64	280 04	672 66	
1893		1853 70	1833 70		"		"	"	94 80	11	13 65	262 88	836 37	
1894		1111 26	1111 26		"		"	"	18 18	9	10 78	196 07	776 31	
1895		971 38	971 38		"		"	"						
		\$ 20380 72	18831 08	\$ 10449 64								\$ 3817 75	\$ 6631 80	

Check (13) plus (14) equals (5) \$ 3817 75
 6631 80
 \$10449 64

CONDUITS.

About \$17,000.00 has been expended during the year constructing conduits and placing underground city wires in the conduit district.

The conduits in West Leonard street, South Division street and Lagrave street were laid in advance of the improvement.

Two lines of conduit were laid on West Leonard street, one on each side of the street. The conduits on the north side being intended for low tension systems, and those on the south side for high tension systems. No. 9 engine house is connected with the West Leonard street conduit and No. 1 engine house with the Lagrave street conduits.

The following tabulation gives receipts and expenditures of the Conduit Fund for each street during the past year, and the number of ducts in each street.

STATEMENT OF CONDUIT FUND, MARCH 31, 1908.

	Receipts	Disbursements	Edison Co. Share paid	Number of duots
Balance in fund March 31, 1907.....	\$ 574 70	.....	.....	.....
Temporary loan from general fund April 12, 1907.....	3700 00	.....	.....	.....
Return of loan to general fund August 26, 1907.....	.....	\$ 3700 00	.....	.....
Budget allowance July 27, 1907.....	5000 00	.....	.....	.....
Budget allowance August 26, 1907.....	10000 00	.....	.....	.....
E. Bridge St. at Ionia St.....	.....	15 56	.....	.....
N. Division St. at Park St.....	.....	89 77	.....	.....
S. Division St. Fulton to Wealthy.....	1147 81	.....	\$ 1147 81	.....
S. Division St. Wealthy to Fifth.....	28 55	2857 88	.....	6 multiple tile
W. Leonard St.....	273 26	8072 89	.....	6 multiple tile
Lagrange St. Fulton to Wealthy.....	.....	740 54	.....	2 Single tile Fulton—Engine House
E. Fulton St.....	542 67	34 71	542 67	4 Single tile Engine House to Oakes
W. Fulton St.....	449 73	.....	449 73	8 3/4 inch iron pipe
Fulton St. Bridge.....	.....	833 56	.....	.....
Lighting Plant Cables.....	.....	4423 70	.....	.....
W. Park Place at Park St.....	.....	22 22	.....	.....
Police Headquarters.....	.....	7 06	.....	.....
Crescent Avenue.....	.....	12 00	.....	.....
Stock.....	.....	226 75	.....	.....
Cartage.....	.....	14 55	.....	.....
Telegrams.....	.....	65	.....	.....
Labor storing equipment.....	.....	1 50	.....	.....
Drawing plans for corporations (to be charged).....	.....	10 00	.....	.....
	\$ 21716 23	\$ 21135 33	\$ 2130 71	
	21135 33			

Balance in fund March 31, 1908.....

\$ 580 89

Assets

Accounts receivable on hand Mar. 31, 1908.	15 00
Corporation plans (to be charged)	10 00
Stock	226 79
	<u>\$ 251 75</u>

BRIDGE WORK.

The cost of repairing bridges during the past year has been large, the principal items being in the painting of Leonard street bridge, and the covering of the old roof with new tar felt with a ten year guaranty; also the construction of one new ice breaker at Sixth street, two at Pearl street and three at Fulton street. Sixth street bridge was also replanked.

At Wealthy avenue the turning machinery was thoroughly overhauled, lamps purchased and bridge tender's house built.

The old Bridge street bridge spans were on property on which the City had tax titles. These tax titles were cleaned up by the owners and it was necessary to move the spans to adjacent property for which a rental of \$5.00 per month is paid. The City should have large storage yard in which such materials could be stored.

The following is a list of the expenditures on the various bridges for the past fiscal year.

LEONARD STREET BRIDGE.

Labor	\$791 36
Engineering	41 00
Lumber	57 68
Nails	3 05
Painting material	245 84
Oil, grease, etc	12 01
Gravel	2 50
Carfare	5 10
Cartage	5 25
Roofing	841 50
Sidewalk	255 79
	<hr/>
	\$2261 08

SIXTH STREET BRIDGE.

Labor	\$ 702 44
Engineering	87 00
Cartage	16 50
Tools	7 75
Nails	56 78
Cement	64 06
Lumber	1120 54
Coal	14 08
Paint	2 41
1 cord wood	2 75
Oil, grease, etc	10 07
Gravel	18 60
Carfare	3 40
Teaming	16 00
Boat rent	2 38
Sidewalk	65 10

\$2134 81

Credit Labor	\$ 13 83
--------------------	----------

" Old lumber	109 18
--------------------	--------

\$123 01	123 01
----------	--------

\$2011 80
PEARL STREET BRIDGE.

Labor	\$291 95
Engineering	28 00
Nails	8 10
Lumber	50 83
Oil, grease, etc	80
Cement	92 22
Gravel	23 80
Carfare	1 15
Cartage	28 35
Tools	4 40

\$529 60

Credit cement	\$33 00
---------------------	---------

83 00

\$496 60

FULTON STREET BRIDGE.

Labor.....	\$2238 89	
Engineering	100 60	
Tools	3 08	
Lumber	629 09	
Nails	21 85	
Washers	2 30	
Oil, grease, lanterns, etc	19 85	
Bolts	21	
Cement	266 33	
Grate	6 65	
Gravel	166 60	
Carfare	8 35	
Sidewalk repair.....	16 76	
Cartage	128 55	
Rent of pump	15 65	
" " scow	42 50	
Miscellaneous	89 49	
		\$3750 60
Credits Gravel	\$ 3 00	
" Lumber	43 01	
		\$46 01
		46 01
		\$3704 59

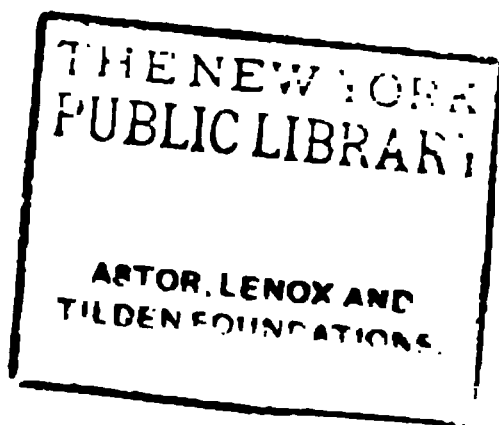
WEALTHY AVENUE BRIDGE.

Labor.....	\$541 55
Swinging.....	300 00
Bridge Tender's House	158 00
Oil, grease, etc	19 30
Plates, rivets, etc.....	40 48
Lamps	115 73
Tools and repairs.....	20 61
Lumber	44 40
Cable	7 15
Cartage	13 55
Carfare and Traveling expenses.....	18 25
Engineering	66 00
Telegrams.....	85
Total.....	\$1345 87



ANN STREET BRIDGE

View Looking Northwest. Four Spans each 150 feet long.



BRIDGE STREET CANAL BRIDGE.

Labor	\$98 46	
Engineering	11 00	
Pails, etc.....	40	
Gravel	13 50	
Cement	30 48	
Carfare	80	
Tools	4 70	
Cartage	19 75	
Nails.....	2 60	
Lumber	1 12	
		<u>\$182 81</u>
Credits: Cement.....	\$2 37	
" Gravel.....	1 00	
	<u>\$3 37</u>	8 37
Net		<u>\$179 44</u>

MOVING OLD BRIDGE STREET SPANS.

Labor	\$100 84	
Engineering	1 00	
		<u>\$101 84</u>
Sale of old iron.....	24 20	
Net		<u>\$ 77 64</u>

INSPECTION COIT BRIDGE OVER G. R. & I.

Railroad at Black Hills.....	\$4 00
------------------------------	--------

TOTAL EXPENDITURES FROM BRIDGE FUND.

Leonard Street Bridge.....	\$2261 08
Sixth " "	2011 80
Pearl " "	496 60
Fulton " "	3704 59
Wealthy Avenue "	1845 87
Bridge Street "	179 44
Old Bridge Street " Spans.....	77 64
Coit Bridge	4 00
	<u>\$10081 02</u>
Total	\$10081 02

ANN STREET BRIDGE.

The Contractor for the substructure continued as soon as the water would permit, completing the work in time for the erection of the steel work. Mr. Prange completed the filling of the east approach and the west approach was filled largely with the material from Indian Mill Creek work.

The superstructure was awarded to the Joliet Bridge and Iron Company for \$36500.00. The completion of this portion of the bridge was delayed due to difficulties in securing steel from the mills. The erection was completed early in March and the creosoted wood block floor laid on creosoted planks was completed at practically the same time.

ANN STREET BRIDGE FUND FOR FISCAL YEAR OF 1907-08.

	Receipts	Disbursement
Balance in fund—March 31, 1907.....	\$55363 13	
Sale of dirt from west approach.....	282 10	
Jan. 1, '08, Return of loan from Flood Work Fund.	10000 00	
Apr. 8, '07, Temporary loan to Flood Work Fund..		\$10000 00
Bond Interest		939 80
Ann Street Bridge—Piers & Abutments.....		11050 02
“ “ “ West Approach.....		7649 67
“ “ “ East “		4171 97
“ “ “ Superstructure		33773 80
“ “ “ Flooring		6108 10
	<hr/>	<hr/>
	\$65645 23	\$73693 36
		65645 23
		<hr/>
Overdraft March 31, 1908.....		\$ 8048 13

DETAIL COSTS.

Piers and Abutments	Previous to April 1, 1907	April 1, 1907 to Mar. 31, 1908	Total
Estimates.....	\$ 6375 00	\$ 9539 00	\$ 15914 00
Deductions.....		196 73	196 73
Eng. & abstracts.....	179 55	74 25	253 80
Inspection.....	60 50	177 84	238 34
Cement.....		47 00	47 00
Stone and gravel.....	917 91	692 53	1610 44
Testing foundation.....	41 00		41 00
Printing and advertising.....	114 16		114 16
Car fare.....	10 20	8 75	18 95
Labor.....		290 82	290 82
Miscellaneous.....		23 10	23 10
Total.....	\$ 7698 32	\$ 11050 02	\$ 18748 34

Superstructure—Steel			
Payments on contract.....		\$ 33410 78	\$ 33410 78
Deductions.....		1 00	1 00
Engineering and inspection.....	\$ 31 00	261 00	292 00
Advertising.....		53 00	53 00
Car fare.....	55	7 50	8 05
Printing.....		40 00	40 00
Telegrams.....		52	52
Total.....	\$ 31 55	\$ 33773 80	\$ 33805 35

Superstructure, Roadway and Paint- ing under same			
Payments on cont. for paving and painting.....		\$ 705 50	\$ 705 50
Creosoting plank and block.....		4785 45	4785 45
Cartage.....		103 41	103 41
Pitch.....		54 40	54 40
Floor bolts.....		185 00	185 00
Headers.....		27 45	27 45
Paint.....		151 65	151 65
Engineering and inspection.....		76 10	76 10
Advertising.....		18 64	18 64
Telegrams.....		50	50
Total.....		\$ 6108 10	\$ 6108 10

East Approach	Previous to April 1, 1907	April 1, 1907 to Mar. 31, 1908	Total
Payments on contract.....		\$ 4019 08	\$ 4019 08
Labor.....		141 09	141 09
Engineering.....		11 00	11 00
Car fare.....		20	20
Total.....		\$ 4171 97	\$ 4171 97

West Approach			
Labor.....	\$ 2394 04	\$ 5107 98	\$ 7502 02
Filing purchased.....	1947 40	2526 30	4473 70
Fence.....	58 50	2 94	61 44
Tools.....	1 15		1 15
Engineering.....		12 00	12 00
Printing and advertising.....	53 71		53 71
Carfare.....		45	45
Total	\$ 4454 80	\$ 7649 67	\$ 12104 47

Total Cost to Date			
Piers and abutments.....	\$ 7698 32	\$ 11050 02	\$ 18748 34
Superstructure, Steel.....	31 55	33773 80	33805 35
Superstrcture, Roadway.....		6108 10	6108 10
East Approach.....		4171 97	4171 97
West Approach.....	4454 80	7649 67	12104 47
Total	\$ 12184 67	\$ 62753 56	\$ 74938 23

INVENTORY OF BRIDGES, 1907.

1	2		3	4	5	6	7	8	9	10	11	12
	Location	Portion	When built	Original Cost	%	Life	5 for \$1.00 Compound n Years	Yearly Deposits (4) - (7)	Age n	5 for \$1.00 n Years	Total D. (5) x (10)	Remaining Value
	Leonard Street	Rear abutment and girder.	1879	\$ 13,192.00	3 1/2	25	\$ 69.00	\$ 191.15	26	\$ 47.91	\$ 9158.00	\$ 4082.00
	Fulton Street	Masonry	1883	18911.92	3 1/2	40	77.66	350.38	24	35.46	9001.84	10819.70
	Pulmon Street	Superstructure	1883	26,439.60	3 1/2	40	77.66	260.73	24	35.46	9654.63	11353.37
	Pearl Street over river	Sub-structure	1884	11884.00	3 1/2	40	77.66	153.75	22	31.45	4816.87	7077.43
	Pearl Street over river	Superstructure	1884	29481.00	3 1/2	40	77.66	263.71	22	31.45	8938.66	13166.38
	Pearl Street over W. Canal	Superstructure	1886	4915.00	3 1/2	40	77.66	64.27	21	29.54	1833.14	2811.86
	Pearl Street over W. Canal	Superstructure	1886	3708.00	3 1/2	40	77.66	68.00	21	29.54	1444.50	2353.50
	Sixth Street	Superstructure	1886	7063.00	3 1/2	40	77.66	102.53	21	29.54	3029.71	4084.29
	Sixth Street	Substructure	1886	2928.40	3 1/2	40	77.66	38.15	21	29.54	7714.38	12566.59
	Bridge Street over W. Canal	Sup. structure	1886	1943.00	3 1/2	40	77.66	12.87	24	35.46	456.87	143.68
	Bridge Street over W. Canal	Old abutments.	1883	1943.00	3 1/2	60	116.18	28.40	6	6.66	156.44	257.54
	Bridge Street over W. Canal	New abutments.	1901	2739.00	3 1/2	60	116.18	4.30	6	6.66	86.64	471.36
	Bridge Street over W. Canal	Cylinder piers.	1897	7482.00	3 1/2	40	77.66	90.13	20	27.67	9403.10	4516.10
	Bridge Street over W. Canal	Old girders	1897	1500.00	3 1/2	40	77.66	20.40	6	6.66	137.80	1462.60
	Bridge Street over W. Canal	New girders	1901	1600.00	3 1/2	40	77.66	54.68	6	6.74	370.73	1239.27
	Bridge Street over E. Canal	Roadway	1901	1600.00	3 1/2	30	59.46	54.68	6	6.74	370.73	1239.27
	Bridge Street over E. Canal	Substructure	1901	2100.00	3 1/2	30	59.46	54.68	6	6.74	370.73	1239.27
	Bridge Street	Superstructure	1901	2100.00	3 1/2	60	254.60	83.48	6	6.54	139.42	2046.18
	Bridge Street	over river.	1903	10,300.00	3 1/2	60	254.60	83.48	6	6.54	139.42	2046.18
	Wesley Avenue main	Substructure.	1904	22397.00	3 1/2	80	254.60	99.35	4	4.26	1678.23	9681.77
	Wesley Avenue main	Superstructure	1904	3800.00	3 1/2	80	254.60	99.35	4	4.26	1678.23	9681.77
	Wesley Avenue arch	Superstructure	1905	18478.00	3 1/2	80	254.60	497.14	3	3.16	312.65	24964.65
	Bridge Street.	In stock	1905	18478.00	3 1/2	80	254.60	66.66	3	3.07	1089.09	37686.96
	Ann Street	Substructure	1907	37637.61	3 1/2	80	254.60	48.29	24	35.46	1713.35	16894.01
	Ann Street	Superstructure	1907	37637.61	3 1/2	80	254.60	48.29	24	35.46	1713.35	16894.01
	Ann Street	Roadway	1907	37637.61	3 1/2	80	254.60	48.29	24	35.46	1713.35	16894.01
	Ann Street	Superstructure	1907	37637.61	3 1/2	80	254.60	48.29	24	35.46	1713.35	16894.01
	Turner Street.	Roadway	1907	6373.47	3 1/2	30	59.46	217.82	0	...	...	37637.61
	Alpine	Indian Mill.	1906	6304.56	3 1/2	50	116.18	65.04	0	...	...	37637.61
	Alpine	Steel (B-S)	1907	1717.04	3 1/2	40	77.66	22.12	0	1.08	56.69	6337.86
	Alpine	Steel (B-S)	1907	638.00	3 1/2	40	77.66	8.06	0	...	...	1717.08
	Broadway	Indian Mill	1907	3207.79	3 1/2	50	116.18	27.61	0	...	...	665.00
	Broadway	Steel (B-S)	1907	6.50	3 1/2	40	77.66	8.06	0	...	...	3207.79
	Broadway	Steel (B-S)	1907	6.50	3 1/2	40	77.66	8.06	0	...	...	665.00

Check equals (11) plus (12) equals (4)..... \$ 63554.84
 255308.79
 942135.61

CONTAGIOUS DISEASE HOSPITAL.

In the Spring, work was continued on the hospital building and plans were also made for a central heating plant. Architects prepared plans for a large central plant, but funds were not available for construction. A small building was finally constructed sufficient to cover one boiler, which will answer for some years.

Concrete conduits were constructed from the heating plant to the main building with provisions for extending future conduits as the demand increases.

A sewerage disposal plant was constructed to care for sewerage until the City system is extended to that district.

Survey for topography map was made to enable the Board of Health to have the grounds laid out for future buildings.

The following is a list of the receipts and expenditures for the Hospital Fund for the fiscal year.

Balance in fund March 31, '07.....	\$ 876 07	
July 18, '07—Allowance from General Fund (Physicians testing).....	2500 00	
July 27, '07—Allowance from Budget.....	3600 00	
Nov. 30, '07, Loan from General Fund.....	2500 00	
Dec. 5, '07, Allowance from General Fund.....	1500 00	
“ “ “ “ “ Contingent Fund	6400 00	
“ “ “ Reimbursement from Hospital Ground Fund for land.....	1160 00	
“ 30, “ Reimbursement from Poor Fund Tub. Hosp. (Sewer and Water).....	226 34	
“ “ “ Return of loan to General Fund.....		\$2500 00
Contagious Dis. Hosp.—Building.....		5750 22
“ “ “ Water Supply		474 91
“ “ “ Wiring and Fixtures.....		547 45
“ “ “ Plumbing		1091 23
“ “ “ Pump and Motor.....		445 69
“ “ “ Heating and Gas Piping....		1517 43
“ “ “ Htg. Plant—Boiler and Steam Piping		1808 80
“ “ “ Htg. Plant Building.....		1067 89
“ “ “ “ “ Chimney.....		574 34
“ “ “ “ “ Conduits.....		1136 87
“ “ “ “ “ Boiler Foundations		628 59
“ “ “ Septic Tank and Filter Bed..		476 43
“ “ “ Tuberculosis Sewer & Water.	29 47	255 81
“ “ “ Sundry (Specified below)....		874 33
	<u>\$18791 88</u>	<u>\$19149 99</u>
		18791 88
Overdraft March 31, '08.....		\$ 358 11

DETAIL COSTS.

Building	Previous to April 1, 1907	April 1, 1907 to Mar. 31, 1908	Total
Payments on contract.....	\$ 3583 00	\$ 4143 45	\$ 7726 45
Engineering	282 00	83 00	315 00
Inspection.....	159 60	337 75	497 35
Advertising.....	13 32	.....	13 32
Plans.....	185 80	.....	185 80
Carfare and livery.....	1 90	4 97	6 87
Cartage.....	.....	1 05	1 05
Land.....	.....	1180 00	1180 00
Pipe and fittings.....	24 00	.....	24 00
Clothes dryer.....	.....	192 00	192 00
Miscellaneous.....	.....	1 23	1 23
Eng.—Topography of grounds.....	.....	77 00	77 00
Total.....	\$ 4199 62	\$ 6020 45	\$ 10290 07

Water Tower and Well			
Tank	\$ 120 00	\$ 360 00	\$ 540 00
Labor	222 75	22 31	245 06
Lumber.....	29 26	14 25	43 51
Sand, gravel and cement.....	23 75	69 47	93 22
Cartage and freight.....	17 80	4 93	22 73
Miscellaneous material.....	.....	2 95	2 95
Well.....	134 73	.....	134 73
Engineering and inspection.....	28 70	1 00	29 70
Pump and motor.....	.....	445 69	445 69
Total.....	\$ 636 99	\$ 990 60	\$ 1557 59

Plumbing			
Payments on contract.....	\$ 1275 00	\$ 1091 23	\$ 2366 23
Advertising.....	12 32	.....	12 32
Total.....	\$ 1287 32	\$ 1091 23	\$ 2378 55

Heating and Gas Fitting			
Payments on contract.....	.....	\$ 1432 84	\$ 1432 84
Advertising.....	.....	12 32	12 32
Engineering .....	.....	71 00	71 00
Car fare and livery.....	.....	1 17	1 17
Bolts.....	.....	10	10
Total.....	.....	\$ 1517 43	\$ 1517 43

Wiring	Previous to Apr. 1, 1907	April 1, 1907 to Mar. 31, 1908	Total
Payments on contract.....		\$ 528 97	\$ 528 97
Advertising.....		18 48	18 48
Total.....		\$ 547 45	\$ 547 45

Heating Plant—Boiler and piping			
Payments on contract.....		\$ 1724 82	\$ 1724 82
Hawley Down Draft Furnace.....		600 00	600 00
Engineering.....		73 00	73 00
Advertising.....		12 44	12 44
Car fare and livery.....		1 87	1 87
Oil.....		77	77
Total.....		\$ 2412 90	\$ 2412 90

Heating Plant, Building, Masonry, etc.			
Payment on Building.....		\$ 885 00	\$ 885 00
Payment on Chimney.....		512 00	512 00
Engineering.....		261 00	261 00
Plans (for larger building).....		75 00	75 00
Advertising.....		18 79	18 79
Carfare and livery.....		4 68	4 68
Labor.....		1063 38	1063 38
Gravel.....		120 62	120 62
Cement.....		269 95	269 95
Lumber.....		43 41	43 41
Cartage.....		3 45	3 45
Miscellaneous materials.....		97 11	97 11
Rent of Kettle.....		23 30	23 30
Total.....		\$ 3377 69	\$ 3377 69

Sewage Disposal Plant			
Labor.....		\$ 278 63	\$ 278 63
Gravel.....		30 00	30 00
Cement and tile.....		63 47	63 47
Castings.....		44 79	44 79
Lumber.....		6 51	6 51
Cartage.....		4 50	4 50
Miscellaneous.....		2 80	2 80
Engineering.....		74 00	74 00
Carfare and livery.....		1 73	1 73
Total.....		\$ 506 43	\$ 506 43

Total Expenditure	Previous to April 1, 1907	April 1, 1907 to Mar. 31, 1908	Total
Building	\$ 4198 62	\$ 6020 45	\$ 10290 07
Water Tower and Well.....	636 99	920 60	1557 59
Plumbing,	1287 32	1091 23	2378 55
Heating and Gas Fitting.....	.....	1517 43	1517 43
Wiring.....	.....	547 45	547 45
Heating Plant—Boiler and piping.....	.....	2412 90	2412 90
Heating Plant—Building, Masons, etc.....	.....	3377 69	3377 69
Sewage Disposal Plant.....	.....	506 43	506 43
Total.....	\$ 6123 93	\$ 16394 18	\$ 22518 11

OPENING OF STREETS.

The methods of the preceeding year have been followed during the past year in the issuing of permits for the opening of streets. There were issued during the year permits to the number 1587, divided as follows:

Sewer connections.....	286
Water connections.....	345
Sewer and Water connections.....	659
Miscellaneous connections.....	258
Conduit connections.....	32
Cancelled	7
<hr/>	
Total.....	1587

STREET OPENING FUND.

FISCAL YEAR ENDING MARCH 31, 1908.

	Receipts	Disbursements	Balance of Accts. Receivable
Balance in fund March 31, 1907.....	\$ 833 11		
Inspection—Work.....	650 39	\$ 863 73	18
Inspection—Street.....	647 77	674 04	
Inspection—Corporation.....	501 52	514 83	3 15
Rolling.....	714 00	786 84	4 00
Repairs—Labor.....	4195 66	1451 21	273 52
Repairs—Material.....		2519 21	175 39
Transfers.....	2883 51	2844 09	
Stock, labor.....		384 34	
Sprinkler.....	41 00	303 00	2 40
Tools.....		24 24	
Engineering and carfare.....		140 80	
Envelopes		2 25	
Printing.....		6 00	
Incidentals.....			222 89
<hr/>			
.....	\$ 9966 96	\$ 10514 58	\$ 781 46
		9966 96	
<hr/>			
Overdraft March 31, 1908.....		\$ 547 62	

The following table shows the detailed office expense of the department for the year:

SALARIES—

Chargeable to general fund	\$14386 32
" " streets and sewers.....	4051 00
" " water works.....	1147 00
" " bridges.....	645 00
" " sundry funds.....	2899 00
	<hr/>
	\$28128 22

SUPPLIES—

Office, postage and express.....	\$ 99 22
Livery.....	40 00
Printing	303 46
Telephone and Telegrams	40 92
Stationery	9 30
Typewriter	130 25
Files, ink, pencils, pens, etc.....	433 67

DRAFTING AND BLUE PRINTING—

Blue print paper.....	128 07
Tracing paper	85 24
Map "	8 00
Profile "	67 12
Ink and Miscellaneous paper	23 03

FIELD—

Livery.....	166 50
Repairs.....	13 27
Supplies.....	118 76
Testing.....	29 28
Carfare.....	1110 35
New Transit.....	267 35
Sewer mirrors	1 75
Transit rent and repairs.....	46 65
Thermometer	8 00
Monuments.....	45 00
Field books	10 00
Cartage	1 95

\$ 3187 14

In addition to the above there were salaries chargeable to the following work for preliminary engineering:

\$ 26315 36

Flood prevention	\$ 3000 00
Grade separation	880 00
Lake Michigan water supply	1114 00
S. Front St. Trunk Sewer	407 00
East Side Trunk Sewer	170 00
	<hr/>
	5560 00

ENGINEERING RECEIPTS OF YEAR:

Engineering	\$ 8190 00
Carfare	380 70
Corporation work	111 49
" inspection	115 26
Library	8 87
Envelopes	2 08
Thermometers	8 00
Postage	5 30
Blue prints for funds	18 38
Inspection " "	8 75

Accounts receivable on hand March 31, 1908....\$ 4307 67

INSPECTION.

Street Opening	Work	\$ 303 75
	Street	674 04
	Corporations	514 83
Water works extension, mains		1195 29
Standpipe		248 79
Improvements		5882 11
Sewers		5631 93
Ann Street Bridge		263 74
Contagious disease hospital		337 75
Flood work,		635 30
Fence around reservoir		113 95

\$16531 34

The expenses of the department have been larger during the past year due to the large amount of special work in hand. At the end of another year, the force employed by the department will be very materially reduced.

Respectfully submitted,

L. W. ANDERSON,
City Engineer.

THIRTY-SIXTH

ANNUAL REPORT

OF THE

Board of Public Works

TO THE

COMMON COUNCIL

OF THE

City of Grand Rapids, Michigan

**TRANSMITTING THE REPORTS OF THE SECRETARY
GENERAL MANAGER, CITY ENGINEER, CHIEF
CLERK AND CHIEF INSPECTOR**

FOR THE

YEAR ENDING MARCH 31, 1909

**GRAND RAPIDS, MICH.
PRESS OF WEST MICHIGAN PRINTING CO.
1909**

449074

REPORT OF THE BOARD OF PUBLIC WORKS

GRAND RAPIDS, MICH., April 1, 1909.

To the Honorable Common Council:

GENTLEMEN:—Herewith are transmitted Annual Reports from the Department of Municipal Government under the jurisdiction of this Board, also inventories covering the Water Works, Electric Lighting System and Bridges.

Respectfully submitted,

GEORGE C. PEIROE, President,
WM. M. GORMLEY,
HENRY J. KLEVORN,
EDWARD H. CHRIST,
JOHN WIDDICOMB,
GEO. E. ELLIS, Mayor.

REPORT OF THE SECRETARY AND GENERAL MANAGER

OFFICE OF THE BOARD OF PUBLIC WORKS, }
GRAND RAPIDS, MICH., April 1, 1909. }

To the Honorable Board of Public Works:

GENTLEMEN:—We respectfully submit to your Honorable Body a resume of the work accomplished by the several departments of the City Government under your jurisdiction, for the year ending March 31, 1909.

Respectfully submitted,

SAMUEL A. FRESHNEY,
Secretary and General Manager.

REPORT OF CHIEF CLERK

SAMUEL A. FRESHNEY,

Secretary and General Manager, Board of Public Works.

DEAR SIR:—Herewith is presented Annual Report of the Water Works System, Municipal Lighting Plant, and Highway and Sewer Departments showing the cost of operation and maintenance; also financial statements pertaining thereto.

WATER WORKS FUND

Annual statement of receipts and disbursements for the year ending March 31, 1909.

TOTAL RECEIPTS	TOTAL DISBURSEMENTS
For water rates.....\$159,528 97	Maintenance of Station.....\$ 34,902 60
For water for fire hydrants..... 10,000 00	Distribution..... 14,138 63
For water for flushing sewers... 2,000 00	Inspection department..... 4,300 93
For water furnished fire engine houses..... 275 00	Office department..... 4,026 69
For tapping mains..... 2,775 00	Construction..... 16,054 44
For plumbers' licenses..... 540 00	Refunded water rates..... 993 94
For reading and repairing water meters..... 12,733 55	Deposited to sinking fund..... 79,635 16
For sale of water meters..... 464 00	Loan to water works extension fund..... 14,000 00
For setting water meters..... 1,558 77	
For sale of material..... 2,817 19	
For fines and capping..... 212 50	
For operating 50 arc lamps from Oct. 3, '08..... 411 19	
Total receipts.....\$192,816 17	Total disbursements....\$168,096 39

DETAIL OF RECEIPTS AND DISBURSEMENTS

STATION

	Credit	Debit	Cr. Bal.	Dr. Bal.
Superintendence.....		\$666 60		
Clerks.....		270 00		
Engineers.....	\$114 05	2,707 72		
Firemen, Coal-passers, etc.....	114 05	6,664 23		
Buildings and Grounds.....		90 02		
Engines.....		1,413 35		
Boilers.....	246 17	1,564 52		
Coal.....	170 02	19,837 00		
Oils.....	55 78	364 29		
Waste.....	23 44	260 06		
Supplies and Tools.....	5 86	1,064 81		
	\$729 37	\$34,902 60		\$34,173 23

DISTRIBUTION

	Credit	Debit	Cr. Bal.	Dr. Bal.
Superintendence.....		\$1,746 60		
Clerks.....		1,050 00		
Water mains.....	\$1,180 88	1,991 41		
Reading meters.....	6,349 46	1,396 68		
Repairing meters.....	6,384 09	1,770 50		
Supplies and tools.....	171 20	961 83		
Stables.....	1 50	1,021 83		
Reservoir.....		3 87		
Fire hydrants.....	15 00	894 28		
Sprinkling cranes.....		13 01		
Valves.....	23 71	199 09		
Services.....	2,829 49	2,819 69		
Shop and storeroom.....		52 77		
Books.....		26 00		
Intake.....		235 07		
	\$16,955 33	\$14,182 63	\$2,772 70	

INSPECTION DEPARTMENT

	Credit	Debit	Cr. Bal.	Dr. Bal.
Chief inspector and assistants.....		\$3,952 44		
Stables.....		219 96		
Car tickets.....		100 00		
Supplies.....		16 53		
Telephone.....		12 00		
Fines and capping.....	\$212 50			
	\$212 50	\$4,300 93		\$4,088 43

OFFICE DEPARTMENT

	Credit	Debit	Cr. Bal.	Dr. Bal.
Clerks.....		\$3,066 16		
Books, blanks, etc.....		429 42		
Postage.....		136 00		
Telephones.....		48 00		
Office supplies.....		264 31		
Office expense.....		82 80		
		\$4,026 69		\$4,026 69

EXTENSION AND CONSTRUCTION

	Credit	Debit	Cr. Bal.	Dr. Bal.
Buildings and grounds.....		\$22 45		
Machinery.....		638 33		
New water mains.....	\$552 23	7,451 39		
Water meters.....	464 00	5,912 42		
Setting meters.....	1,558 77	1,646 30		
New water supply.....		383 65		
	\$2,575 00	\$16,054 44		\$13,479 44

COLLECTION DEPARTMENT

	Credit	Debit	Cr. Bal.	Dr. Bal.
For water rates collected.....	\$159,528 97			
Deposited to credit of sinking fund.....		\$79,635 16		
Water for fire hydrants.....	10,000 00			
Water for flushing sewers.....	2,000 00			
Water furnished fire engine houses.....	275 00			
For plumbers' licenses.....	540 00			
For refunded water rates.....		993 94		
For loan to water works extension fund..		14,000 00		
	\$172,343 97	\$94,629 10	\$77,714 87	

SUMMARY

	Credits	Debits
Cash on hand April 1, 1908.....	\$78,357 87	
Station.....		\$34,173 23
Distribution.....	2,772 70	
Inspection department.....		4,088 43
Office department.....		4,026 09
Construction.....		13,479 44
Collection department.....	77,714 87	
Cash on hand March 31, 1909.....		103,077 65
	\$158,845 44	\$158,845 44
Cash on hand April 1, 1909.....	\$103,077 65	

Accts. Recv. (Material).....\$ 495 42	Accounts payable.....\$ 75
" " (Permits).....7 50	
" " (Water rates).....3,725 79	
" " (Meter charges).....687 10	
" " (Loan to exten.fund) 14,000 00	

Total paid for maintenance and operation previous to April 1, 1909.....	\$1,412,750 38
Paid during past year.....	42,288 35
	\$1,455,038 73
Total paid on construction account during past year from Water Works fund.....	13,479 44
Total paid on construction account during past year from Water Works extension fund.....	20,627 53
Total paid for construction acct. during past year.....	\$ 34,106 97
Paid previous to March 31, 1908.....	\$1,902,662 70
Total investment as shown by book to date.....	\$1,936,769 67
DEDUCTIONS:	
Mains and machinery abandoned and removed since year 1873..	\$221,323 19
Depreciation (as per tables following).....	208,491 80
Surveys, engineering, etc., on new water supply.....	17,410 47
Miscellaneous unclassified accounts.....	58,207 75
	\$ 503,433 21
Present value as shown by inventory.....	\$1,433,336 46

DETAIL STATEMENT OF OPERATION OF CITY PUMPING STATION

	Total cost of	Average cost per day	Average cost per million gallons	Average cost per million gallons raised one foot (Dynamic)
Coal.	19,997 59	54 78	3 59	.0303
Wages	9,996 66	27 39	1 79	.0101
Repairs.....	2,645 44	7 25	47	.0026
Supplies	1,309 19	3 59	24	.0013
Oils and Grease.....	312 55	86	06	.0005
	34,261 43	93 87	6 15	.0348

Total pounds coal consumed for year.....14,557,340
Average pounds consumed per day 39,883
Average cost of coal per 2,000 pounds.....\$ 2.75

COMPARATIVE STATEMENT

	1904-5	1905-6	1906-7	1907-8	1908-9
Average gallons pumped per day	13,986,651	12,404,970	14,772,492	14,728,615	15,252,602
Average cost to pump 1,000,- 000 gallons	\$ 7 00	\$ 6 48	\$ 6 59	\$ 7 04	\$ 6 15

WATER REPORT
TABLE SHOWING THE AMOUNT OF WATER PUMPED INTO THE HIGH AND LOW SERVICES FOR
THE YEAR ENDING MARCH 31, 1908, AND THE TOTAL PUMPING RECORD

	Total Gallons pumped per month	Average Gallons pumped per day	LOW SERVICE		HIGH SERVICE	
			Total Gallons pumped per month	Average Gallons pumped per day	Total Gallons pumped per month	Average Gallons pumped per day
April	563 373.334	13 109.111	321 301.646	7 370.732	141 071.379	4 732.379
May	309 811.040	11 877.770	280 341.223	7 394.531	138 959.718	4 483.864
June	307 073.304	16 090.730	318 769.334	10 135.931	303 833.560	8 795.119
July	555 181.384	17 939.691	533 101.566	10 740.908	523 856.828	7 168.934
August	591 332.519	19 139.658	551 153.945	11 287.021	542 173.574	7 813.451
September	619 470.106	20 639.018	549 012.847	11 610.034	571 467.546	9 049.034
October	613 160.281	16 844.187	575 874.849	8 890.179	100 605.372	8 345.008
November	488 970.610	14 399.180	558 150.132	8 692.346	170 971.733	5 065.794
December	445 974.106	14 389.393	537 154.056	9 384.646	156 151.043	5 101.614
January	447 397.619	14 428.180	384 070.130	9 184.007	162 737.473	5 442.874
February	373 045.868	13 444.000	324 794.034	8 294.433	141 791.844	5 003.037
March	390 146.108	13 665.454	340 413.593	7 755.276	149 735.540	4 880.179
Totals ..	5,569 538.035	15 396.187	3,598 076.333	9 332.793	2,901 355.702	8 086.910
Average						

WATER WORKS INVENTORY
TOTAL INVESTMENT AS SHOWN BY BOOKS, DEDUCTIONS AND DEPRECIATION

	Total	Charged Off	Removed	Present Values
Water Mains.....	\$1,294,649 86	\$50,289 05	\$137,648 02	\$1,106,712 79
Pumping Station (Property)	70,336 55	20,038 63	281 39	50,016 54
" " (Machinery)	210,499 38	85,752 30	31,433 90	93,313 09
Reservoirs.....	113,330 66	30,163 52	28,700 10	54,567 04
Intakes.....	29,280 72	4,153 54	18,831 08	6,296 10
St-andpipes.....	45,054 41	6,832 39	53 61	38,169 41
Meters and connections.....	97,999 87	9,362 39	4,376 00	84,261 49
Surveys, engineering, etc . on new water supply.....	17,410 47	17,410 47		
Miscellaneous maintenance and unclassified accounts.....	58,207 75	58,207 75		
	\$1,936,769 67	\$232,110 62	\$221,323 19	\$1,433,836 46

WATER WORKS BONDS AND INTEREST TABLE

SERIES	DUE	Date of Issue	Date of Maturity	Com. & Ex.	Principal	Rate	Int. and Ex.	Total Int. & Ex.
Fifth.....	May 1.....	May, 1889.....	May, 1909.....	\$ 4 00	\$ 80,000 00	5 %	\$2,004 00	\$ 4,008 00
Sixth.....	Nov. 1.....	Jan. 1892.....	Jan. 1912.....	13 50	300,000 00	4½ %	2,514 00	13,537 00
Refund.....	July 1.....	Oct. 1893.....	Oct. 1913.....	13 50	225,000 00	4½ %	6,763 50	10,145 24
Refund.....	Oct. 1.....	June, 1895.....	June 1915.....	10 12	100,000 00	4 %	5,072 62	4,008 00
Ninth.....	April 1.....	July, 1903.....	July, 1923.....	10 12	80,000 00	3½ %	2,004 00	2,800 00
Tenth.....	June 1.....	July, 1903.....	July, 1924.....	4 00	90,000 00	4 %	2,104 00	3,600 00
Eleventh.....	Dec. 1.....	Aug. 1906.....	Aug. 1926.....	4 00	75,000 00	3 %	1,400 00	3,000 00
Twelfth.....	July 1.....	March, 1908.....	March, 1928.....		50,000 00	4½ %	1,800 00	2,250 00
Refund.....	Jan. 1.....	Sept. 1908.....	March, 1909.....		12,500 00	4 %	1,500 00	250 00
Refund.....	Aug. 15.....	Sept. 1908.....	Sept. 1909.....		12,500 00	4 %	1,125 00	250 00
Refund.....	Feb. 15.....	Sept. 1908.....	Sept. 1910.....		12,500 00	4 %	1,125 00	500 00
Refund.....	March 1.....	Sept. 1908.....	March, 1910.....		12,500 00	4 %	250 00	500 00
Refund.....	Sept. 1.....	Sept. 1908.....	Sept. 1910.....		12,500 00	4 %	250 00	500 00
Refund.....	March 1.....	Sept. 1908.....	March, 1911.....		12,500 00	4 %	250 00	500 00
Refund.....	Sept. 1.....	Sept. 1908.....	Sept. 1911.....		12,500 00	4 %	250 00	500 00
					\$1,075,000 00			\$46,088 24

Fourth series of bonds amounting to \$175,000.00 were retired Sept. 1, 1908, as follows:
Cash from Water Works Sinking Fund.....\$75,000 00
Reissue of 6 \$12,500.00 bonds (taken by General Sinking Fund) payable semi-annually..... 75,000 00

*This issue was retired March 1, 1909.

WATER WORKS EXTENSION FUND

	Credit	Debit
Debit balance April 1, 1908.....		\$23,216 88
Received from sale of bonds	\$50,000 00	
Return of loan to Contingent Fund.. .		20,000 00
Loan from Water Works Fund.....	14,000 00	
For sale of Material.....	874 37	
Disbursements		21,501 90
Cash on hand March 31, 1909.....		155 59
	\$64,874 37	\$64,874 37

Cash on hand April 1, 1909.....	\$ 155 59	
Accounts receivable (material).....	18 53	
Accounts payable, (Loan)		\$14,000 00

WATER WORKS SINKING FUND

	Credit	Debit
Cash on on hand April 1, 1908	\$ 61,504 29	
¼ of receipts for sale of water	79 635 16	
Accrued interest on bonds	331 07	
¼ of refunded water rates		\$ 501 02
Interest on bonds.....		43,549 72
Payment of bonds.....		162,575 00
Loan from General Sinking Fund	75,000 00	
Cash on hand March 31, 1909.....		9.844 78
	\$216,470 52	\$216,470 52

Cash on hand April 1, 1909.....	\$9,814 78	
Accounts receivable, (Water Rates).....	3,723 79	
Accounts payable (Loan).....		\$62,500 00

SUMMARY OF STATISTICS

IN FORM RECOMMENDED BY THE NEW ENGLAND WATER WORKS ASSOCIATION, FOR THE YEAR ENDING MARCH 31, 1909.

GENERAL STATISTICS.

Population by census of 1900, 87,565; and in 1909, 115,000.

Date of construction—1873

By whom owned—the city.

Source of supply—Grand River.

Mode of supply—pumping.

PUMPING STATISTICS.

- 1 Builders of Pumping Machinery—Holly, Nordberg and Butterworth & Lowe.

- 2 Description of Fuel {
 - a Kind: Bituminous.
 - b Brand of coal: West Virginia Slack.
 - c Average price per gross ton, delvd.: \$3.08.
 - c Average price per net ton, delvd.: \$2.75.
 - d Percentage of ash: 8 per cent.
 - e Wood price per cord: None used.

- 3 Coal consumed for the year: 14,557,340 lbs. A.

- 4 (Pounds of wood consumed) $\div 3$ = equivalent amount of coal: none.

- 4a Amount of other fuel used: none.

- 5 Total equivalent of coal consumed for the year: (3) plus (4) 14,557,340 lbs.

- 6 Total pumpage for the year: 5,569,336,035 gallons without allowance for slip. A.

- 7 Average static head against which pumps work: 138 5 (low service) ft.
Average static head against which pumps work: 197. (high service) ft.

- 8 Average dynamic head against which pumps work: 152 (low service) ft.
Average dynamic head against which pumps work: 201. (high service) ft

- 9 Number of gallons pumped per pound of equivalent coal (5) 383 gals.

- 10 Duty = gals. pumped (6) \times 8 84 (lbs.) \times 100 \times dynamic head (8) = 56,156,511
Total fuel consumed, (5).

- 11 Cost of pumping, figured on pumping station expenses, viz: \$34,261.48
per million gallons pumped. \$6.15 A.

- 12 Per million gallons raised one foot (dynamic): \$0.0848 A.

STATISTICS OF CONSUMPTION OF WATER.

- 1 Estimated population to date: 115,000.
- 2 Estimated population on pipe lines: 85,000.
- 3 Estimated population supplied: 80,000.
- 4 Total consumption for the year: 5,569,336,035 gals.
- 5 Passed through meters: 1,835,868,700 gals.
- 6 Percentage of consumption metered: 33 per cent.
- 7 Average daily consumption: 15,252,602 gals.
- 8 Gallons per day to each inhabitant: 133 gals.
- 9 Gallons per day to each consumer: 190 gals.
- 10 Gallons per day to each tap: 890 gals.
- 11 Cost of supplying water, per million gallons, figured on total maintenance (item CC): \$10.58.
- 12 Total cost of supplying water, per million gallons, figured on total maintenance plus interest on bonds (item CC plus DD): \$18.41.

STATISTICS RELATING TO DISTRIBUTING SYSTEM.

- 1 Kind of pipe: cast iron.
- 2 Sizes: 4 in. to 36 in.
- 3 Extended during year: 15,507.36 feet.
- 4 Discontinued during year: none.
- 5 Total now in use (in miles): 175 miles 2772 feet.
- 6 Cost of repairs per mile: \$1.63.
- 7 Number of leaks per mile: one.
- 8 Length of pipe less than 4 in. diam.: none.
- 9 Number of hydrants added during year (public): 30.
- 10 Number of hydrants now in use (public): 1,688.
- 11 Number of stop gates added during year: 93.
- 12 Number of stop gates in use: 1,882.
- 13 Number of stop gates smaller than 4 in.: none.
- 14 Number of blow-offs: 7.
- 15 Range of pressure on mains: 22 lbs. to 93 lbs.

SERVICES.

- 16 Kind of pipe: ½ in. to 2 in. "strong" lead pipe; 2 in. to 4 in. galv. iron.
- 17 Sizes: ½ in. to 6 in.
- 18 Extendedfeet.
- 19 Discontinued.....feet.
- 20 Total now in use.....feet.
- 21 Number of service taps added during year: 899.
- 22 Number now in use: 17,125.

- 23 Average length of service: 25 ft.
- 24 Average cost of services per year: \$.....
- 24a Average cost of services for the year (private): \$.....
- 25 Number of meters added during year: 860.
- 26 Number now in use, 6,328.
- 27 Percentage of services metered: 37 per cent.
- 28 Percentage of receipts from metered water (B ÷ C): 46 per cent.
- 29 Number of motors and elevators added: 6.
- 30 Number now in use: 56.

FINANCIAL STATISTICS.

RECEIPTS.

Balance brought forward (a) from ordinary (main-tenance) receipts.....		\$ 78,357 87
(b) From extraordinary receipts (bonds) debit.....	\$ 23,216 88	
(b) From Sinking Fund.....		61,504 29
Total net balance		<u>\$116,645 28</u>
(a) From water (a) rates (fixtures).....	86,094 22	
(b) Meter rates.....	78,434 75	
(c) Total from consumers		<u>\$159,528 97</u>
(d) For fire hydrants.....	10,000 00	
(e) For fountains (metered).....		
(f) For flushing sewers	2,000 00	
(g) For public buildings (metered).....		
(h) From fire engine houses.....	275 00	
(i) General appropriations.....		
(j) Total from municipal departments.....		12,275 00
(k) From tax levy.....		
(l) From bond issue		125,331 07
(m) From other sources:		
Water permits for tapping.....	2,275 00	
Plumbers' licenses.....	540 00	
Reading and repairing water meters.....	12,733 55	
Sale of water meters.....	464 00	
Setting water meters.....	1,558 77	
Sale of material.....	3,691 56	
Fines and capping fixtures.....	212 50	
Operating municipal arc lights.....	411 19	21,886 57
Net total.....		<u>\$435,666 89</u>

EXPENDITURES.**Water works maintenance:**

(aa) Operation (management and repairs).....	58,907 81	
(bb) Special		
(cc) Total maintenance.....	\$58,907 81	
(dd) Interest on bonds	43,549 72	
(cc) plus (dd) Maintenance and interest.....		\$102,457 53
(ee) Payment of bonds.....		162,575 00
(ee) Payment of loan.....		20,000 00
(ff) Sinking fund.....(See below)		

Water works construction:

(gg) Extension of mains.....	28,953 29	
(hh) Extension of services.....		
(ii) Extension of meters.....	7,558 62	
(jj) Special		
Pumping station.....	660 78	
New water supply.....	383 65	

Plus

(kk) Total construction		37,556 34
(ll) Unclassified expenses.....		
(mm) Balance.....		
(aa) Ordinary.....	103,077 65	
(bb) Extraordinary.....	155 59	
(bb) Sinking fund.....	9,844 78	
Total balance.....		113,078 02
Net total.....		\$435,666 89

Disposition of balance retained as working capital:

(o) Net cost of works to date.....	\$1,936,769 67	
(p) Bonded debt to date	1,002,500 00	
(q) Value of sinking fund.....	9,844 78	
(r) Average rate of interest.....	4.3%	

LIGHTING PLANT.**ANNUAL STATEMENT OF RECEIPTS AND DISBURSEMENTS
FOR THE YEAR ENDING MARCH 31, 1909.**

TOTAL RECEIPTS		TOTAL DISBURSEMENTS	
Budget Appropriations:		Maintenance of Station.....	
Operation	\$30,500 00	Distribution.....	\$23,056 07
Budget Appropriations:		Office Department	9,685 68
Consolidation plans	29,500 00	Construction	392 04
Rent of arc lamps.....	143 13	Loan to General Fund.....	6,481 76
Material sold.....	179 19		\$0,000 00
	<u>\$60,322 32</u>		<u>\$59,615 55</u>

**DETAIL OF RECEIPTS AND DISBURSEMENTS
STATION**

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Superintendence	\$	\$ 1,333 20		
Clerk.....		480 00		
Engineers.....		2,029 21		
Fireman, Coal Passers, etc.....		2,011 32		
Dynamo-tenders.....		1,320 00		
Buildings and Grounds.....	1 00	23 59		
Engine repairs		411 62		
Boiler repairs.....		347 58		
Coal		13 886 37		
Oils and grease	9 75	422 43		
Waste.....		88 53		
Dynamo repairs		210 48		
Switchboard and connections.....		12 40		
Supplies and tools.....		479 34		
	\$ 10 75	\$ 23 056 07		\$ 23,045 32

DISTRIBUTION

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Trimmers and Linemen.....	\$	\$ 4,052 12	\$	\$
Lines and cables.....	105 35	421 78		
Towers	26 77	301 21		
Lamps, (including salary of repair man).....	13 56	1,556 65		
Globes		1,099 20		
Carbons		1,269 84		
Trimming supplies.....		7 58		
Stables.....		973 21		
Books, blanks, etc.....		4 00		
	\$ 145 68	\$ 9,685 68		\$ 9,540 00

OFFICE DEPARTMENT

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Clerks.....	\$	\$ 347 84	\$	\$
Printing and Stationery.....		43 20		
Office Supplies.....		1 00		
	\$	\$ 392 04	\$	\$ 392 04



**VIEW OF FLOOD WALL NEAR LIGHTING PLANT,
Taken from Pere Marquette Bridge.**

4

CONSTRUCTION

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Electric Plant	\$	\$ 658 89	\$	\$
Lines and Cables	22 76	4,179 03		
Lamp-posts		61 33		
New Lamps		1,582 51		
	\$ 22 76	\$ 6,481 76	\$	\$ 6,459 00

COLLECTION DEPARTMENT

	Cr.	Dr.	Cr. Bal.	Dr. Bal.
Budget Appropriation	\$ 60,000 00	\$	\$	\$
Rent of arc lamps	143 13			
Loan to General		20,000 00		
	\$ 60,143 13	\$ 20,000 00	\$ 40,143 13	\$

SUMMARY

	Credits	Debits
Cash on hand April 1, 1908	\$ 478 64	\$
Station maintenance		23,045 32
Distribution		9,540 00
Office Department		892 04
Construction Department		6,459 00
Collection Department	40,143 13	
Cash on hand March 31, 1909		1,185 41
	\$ 40,621 77	\$ 40,621 77
Cash on hand April 1, 1909	1,185 41	
Accounts receivable, (Material)	37 50	
Accounts receivable (Loan)	20,000 00	

Total amount paid for maintenance and operation previous to April 1, 1908	\$215 704 09
Paid during past year	32 977 36
Total amount paid to date	\$248,681 45
Total amount paid for construction previous to April 1, 1908	\$214,614 45
Paid during past year	6,459 00
	\$221,073 45
Less depreciation (per inventory) to date	58,630 95
Present values, as per inventory	\$162,442 50

INVENTORY

Engines	\$ 13,924 95
Boilers.	16,183 16
Crane	1,224 77
Electric Equipment	12,828 96
Building and grounds	41,345 28
Towers.	7,365 73
Lines and Cables	66,747 35
Line Supplies	2,822 30
	\$162,442 50
Supplies and tools for Station	\$ 1,154 96

BONDS ISSUED

\$125,000.00 issued May, 1897, 4 per cent interest, \$7.00 per annum exchange.

DETAIL STATEMENT OF OPERATION OF CITY LIGHTING PLANT

	Total cost.	Aver. cost per day.	Aver. cost per lamp per day.	Aver. cost per kilo- wat hour.	Aver. cost per lamp hour.
Coal	\$13,139 70	35.98	.04278	.006226	.004344
Wages	12,281 62	33 65	.04001	.007693	.004063
Carbons	1,218 17	3 34	.00397	.000763	.000403
Globes	1,224 44	3.35	.00398	.000768	.000405
Repairs	1,748 08	4.79	.00570	.001095	.000578
Supplies	2,224 28	6.08	.00723	.001390	.000734
Oils.....	414 69	1 14	.00186	.000260	.000138
	\$32,238 98	88.33	.10503	.020195	.010665

Total pounds of coal consumed	9,753,625	
Average pounds consumed per day	26,722	
Average cost of coal per 2000 lbs.....		\$ 2 69
Average kilo-watt hours per day	4 374	
Average number of lamps in circuit per day	847	
Average number of lamps reported out per day	6	
Average number operated per day	841	
Average number of hours operated per day	10 27	
Average number of lamp hours per day	8,282	
Total number of lamp hours	8,023,737	
Average cost per lamp per year, computed on above basis		\$38 34
Average cost per lamp hour (operation only) .....	.00737	
Average cost per lamp hour (distribution only) .....	.003295	

COMPARATIVE STATEMENT

	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9
Number of lamps operated...	623	697	726	781	804	841
Cost per lamp per year.....	\$ 43 85	\$ 40 36	\$ 35 14	\$ 36 80	\$ 39 21	\$ 38 34

Contract price before plant was built was, in first contract, \$120.00 per lamp per year. In second contract, \$107.00 per lamp per year. Contract price just prior to the installation of Municipal Plant was \$97.00 per lamp per year.

The total cost per lamp per annum for operating (including fixed charges) are as follows:

Maintenance and operation	\$38 34
Loss through non-taxation	3 03
Depreciation	5 34
Bond interest	5 96
Interest on investment over bonded debt	4 57
Total cost per lamp per annum	\$57 24

LIGHTING MUNICIPAL BUILDINGS

CONSTRUCTION DEPT.

**STATEMENT OF RECEIPTS AND DISBURSEMENTS UP TO
MARCH 31, 1909.**

Receipts.	Disbursements
Total appropriations.....\$11,500 00 Sale of materials..... 188 58 <div style="text-align: right;">\$11,688 58</div>	Printing and advertising.....\$ 111 06 Machinery..... 3,971 40 Foundations..... 386 01 Switchboard and connections..... 90 12 Interior wiring..... 4,862 72 Lines and cables..... 2,050 91 Engineering and plans..... 51 00 Meters and instruments..... 165 36 <div style="text-align: right;">\$11,688 58</div>
Cash on hand April 1, 1908..... Disbursed during past year.....	<div style="text-align: right;">\$58 27</div> <div style="text-align: right;">\$58 27</div> <div style="text-align: right;">\$58 27 \$58 27</div>

REVENUE ACCOUNT

Receipts		Disbursements.	
Cash on hand April 1, 1908.....	\$ 863 13	Lamps.....	\$ 781 64
Current for City Hall.....	1,703 94	Supplies and repairs	23 90
Current for Public Library	545 55	Coal	1,753 58
Current for Police Headquarters..	263 07	Switchboard	56 80
Current for High School.....	284 85	Lines and cables.....	314 82
Current for Water Works.....	856 20	Salaries.....	420 00
Current for Public Light.....	65 77	Cash on hand April 1.....	1,680 69
Sale of lamps.....	428 92		
	<hr/>		<hr/>
	\$5,011 43		\$5,011 43
Cash on hand April 1, 1909.....	\$1,680 69		
Accts. Recv. (current, etc.).....	602 14		

LABORATORY TESTING DEPARTMENT

Receipts	Disbursements
Cash on hand April 1, 1908.....\$894 91	For gas testing.....\$128 48
Receipts for gas tests.....8 00	For material tests.....109 13
Appropriated for apparatus.....250 00	For water analysis.....177 94
	<hr/>
	\$415 55
	Bal. cash on hand March 31, 1909....537 36
	<hr/>
	\$952 91
Cash on hand April 1, 1909.....537 36	

STREET SPRINKLING

STREET RAILWAY

On July 26, 1906, a contract was entered into with the Grand Rapids Railway Co., wherein the Railway Co. agrees to sprinkle the full width of the streets which are occupied by its tracks. They to receive as compensation for this work the sum of twelve cents per mile of street sprinkled regardless of the width of the street. The city furnishing the water for this purpose free of charge to the Railway Co. from its public hydrants.

The equipment furnished by the Railway Co. for this service consists of two electrically driven, steel tank cars, one of 2,800 gallon capacity and one of 4,200 gallon capacity.

The sprinkling this season was started on April 13, 1908, and was carried on until October 24, 1908. The following is a statement of the costs, etc., of this work:

Number of miles in route:	28.30.	
Number of miles sprinkled.....	11,771.92 @ 12c per mile	\$1,412 63
Gallons of water used.....	29,121,400 @ 4c per M gals.	1,164 84
Total cost of sprinkling.....		\$2,577 47
Cost of sprinkling per mile.....		\$0.12
Cost of water used per mile.....		.0989
Total cost of sprinkling per mile.....		\$0 2189
Gallons of water used per mile		2,474

HIGHWAY SPRINKLING DEPARTMENT.

The equipment of this department consists of 27 750 gals. tank wagons distributed among the several wards of the city. It is the endeavor of the department to sprinkle all improved streets in the city at least twice during each day of the dry season.

The sprinkling this season was started on April 14, 1908, and carried on until October 21, 1908. The following is a statement of the costs, etc. of this work:

Number of miles of streets included in routes:	158.817.	
Water is furnished by Water Dept. at 4c per 100 cu. ft., 10% off.		
Number of miles sprinkled	22,620.379; cost	\$11,094 00
Gallons of water used.....	77,039,512; cost	3,707 82
Total cost of sprinkling.....		\$14,801.82
Cost of sprinkling, per mile.....		\$0 4909
Cost of water, per mile.. .....		.1635
Average cost of sprinkling, per mile.....		\$0.6544
Gallons of water used per mile.....		3,406

ANNUAL STATEMENT OF RECEIPTS AND DISBURSEMENTS ON HIGHWAYS AND SEWERS

FIRST SEWER

Balance in fund April 1, 1908.....	\$ 1,635 44	
Budget appropriation.....	4,000 00	
Receipts.....	89 81	
Disbursements.....		\$ 4,040 73
To balance.....		1,637 02
	<u>\$ 5,674 75</u>	<u>\$ 5,674 75</u>

SECOND SEWER

Balance in fund April 1, 1908.....	\$ 66 63	
Budget appropriation.....	5,000 00	
Receipts.....	44 48	
Disbursements.....		\$ 5,338 01
Debit balance.....	225 90	
	<u>\$ 5,338 01</u>	<u>\$ 5,338 01</u>

THIRD SEWER

Balance in fund April 1, 1908.....	\$ 4,992 58	
Budget appropriation.....	6,000 00	
Receipts.....	8 10	
Disbursements.....		\$ 2,955 24
Loan to Highway Funds.....		5,000 00
To balance.....		3,040 44
	<u>\$10,995 68</u>	<u>\$10,995 68</u>

SUMMARY

Balance in funds April 1, 1908.....	\$ 6,694 65	
Budget appropriations.....	15,000 00	
Receipts.....	83 89	
Disbursements.....		\$12,330 98
Loan.....		5,000 00
To balance.....		4,447 56
	<u>\$21,778 54</u>	<u>\$21,778 54</u>

FIRST WARD

Balance in fund April 1, 1908.....	\$ 1,854 44	
Budget appropriation.....	7,000 00	
Miscellaneous receipts.....	72 24	
Disbursements.....		\$ 5,505 36
To balance.....		3,331 83
	<u>\$ 8,926 68</u>	<u>\$ 8,926 68</u>

SECOND WARD

Dr. Balance fund April 1, 1908.....	\$	\$ 1,849 45
Budget appropriation.....	7,500 00	
Receipts.....	243 46	
Loan.....	1,900 00	
Disbursements.....		7,843 42
Debit balance April 1, 1909.....	49 41	
	<u>\$ 9,092 87</u>	<u>\$ 9,092 87</u>

THIRD WARD

Balance in fund April 1, 1908.....	\$ 1,138 48	
Budget appropriation.....	7,500 00	
Receipts.....	83 57	
Disbursements.....		\$ 8,275 12
To balance.....		396 96
	<u>\$ 8,672 05</u>	<u>\$ 8,672 05</u>

FOURTH WARD

Dr. Bal. in fund April 1, 1908.....	\$		\$ 456 70
Budget appropriation	7,000 00		
Receipts	138 61		
Loans	2,080 80		
Disbursements		6,588 14	
To balance		88 97	
	\$ 9,138 81	\$ 9,138 81	

FIFTH WARD

Balance in fund April 1, 1908.....	\$ 787 87		
Budget appropriation	7,000 00		
Receipts	80 41		
Disbursements		\$ 6,414 30	
To balance		1,453 98	
	\$ 7,868 08	\$ 7,868 08	

SIXTH WARD

Balance in fund April 1, 1908.....	\$ 55 80		
Budget appropriation	6,000 00		
Receipts	130 58		
Return of loan		\$ 2,000 00	
Disbursements		5,411 60	
To balance		768 88	
	\$ 6,195 43	\$ 6,195 43	

SEVENTH WARD

Debit balance April 1, 1908.....	\$		\$ 88 64
Budget appropriation	5,500 00		
Receipts	79 48		
Loan	1,400 00		
Return of loan		1,400 00	
Disbursements		5,315 06	
To balance		174 73	
	\$ 6,979 08	\$ 6,979 08	

EIGHTH WARD

Balance in fund April 1, 1908.....	\$ 180 82		
Budget appropriation	2,500 00		
Receipts	87 08		
Loan	908 00		
Return of loan		\$ 700 00	
Disbursements		2,657 15	
To balance		391 29	
	\$ 4,648 44	\$ 4,648 44	

NINTH WARD

Balance in fund April 1, 1908.....	\$ 206 34		
Budget Appropriation	4,500 00		
Receipts	138 81		
Loan	1,500 00		
Return of loan		\$ 1,900 00	
Disbursements		4,175 16	
To balance		377 87	
	\$ 6,452 55	\$ 6,452 55	

TENTH WARD

Balance in fund April 1, 1908.....	\$ 193 92		
Budget appropriation	6,000 00		
Receipts	81 98		
Loan	500 00		
Disbursements		\$ 6,378 73	
To balance		447 18	
	\$ 6,755 90	\$ 6,755 90	

ELEVENTH WARD

Balance in fund April 1, 1908	\$ 2,329 21	
Budget appropriation	5,000 00	
Receipts.....	47 00	
Disbursements.....		\$ 4,795 49
To balance		2,581 82
	<u>\$ 7,376 81</u>	<u>\$ 7,376 81</u>

TWELFTH WARD

Balance in fund April 1, 1908	\$ 1,256 47	
Budget appropriation	4,500 00	
Receipts	88 94	
Disbursements.		\$ 3,737 63
To balance		2,107 78
	<u>\$ 5,845 41</u>	<u>\$ 5,845 41</u>

SUMMARY

Balance in funds April 1, 1908.....	\$ 5,078 36	
Budget Appropriations	73,000 00	
Loans.....	8,200 00	
Receipts	1,224 50	
Disbursements		\$70,118 06
Return of loans		6,000 00
To balance		11,984 80
	<u>\$88,103 86</u>	<u>\$88,103 86</u>

DETAIL OF HIGHWAY DISBURSEMENTS—YEAR ENDING MARCH 31, 1909

WARDS	Comptroller's Salary	Clerk's Salary	General Supplies	Rent	Buildings	Skating Rinks	Street Openings	Office Expenses, etc.	Salable Materials	Repairs	Removals	Removals
FIRST	\$ 168 30	\$ 40 00	\$ 14 99			\$ 12 00		\$ 7 50	\$ 34 00	\$ 1411 84	\$ 6848 30	
Credit			2 40			20 10						
SECOND	\$49 00	17 50	24 50	\$1 00	\$0 43	13 00		7 99	60 75	1818 49	4187 10	140 00
Credit			3 70			31 17					48 75	
Loan												
THIRD	168 30	40 00	12 09				3 15	7 99	47 94	2050 00	3645 87	1038 58
Credit			2 40								2 00	
FOURTH	\$49 00	17 50	25 35	15 00	\$ 71			7 50	48 43	1541 81	1918 55	170 00
Credit			3 70			50					2 00	
Loan												
FIFTH	\$49 00	17 50	19 45	39 00	\$ 73	10 00		7 50	51 35	1911 94	1875 30	79 04
Credit			3 70			41 94						
SIXTH	197 10	28 70	30 13	4 50		11 03	6 01	7 50	58 30	570 43	2702 81	324 35
Credit			3 00			44 35						
SEVENTH	197 10	17 50	22 97	8 50		3 94		7 50	29 40	1825 51	2535 14	117 31
Credit			3 00									
Loan												
EIGHTH	197 10	17 50	18 01	4 50			14 43	7 99	49 13	790 53	1513 89	70 70
Credit			3 00			11 17						
Loan												
NINTH	197 10	17 50	26 79	4 50		41 49		7 99	50 81	530 34	1705 31	145 00
Credit			3 00			100 43						
Loan												
TENTH	168 30	20 00	23 35			14 08		7 50	34 00	3208 30	1542 36	214 00
Credit			2 40			36 95						
Loan												
ELEVENTH	168 30	20 00	14 54			14 02	10 54	7 50	54 10	1268 44	1102 47	101 40
Credit			3 40			23 54						
Loan												
TWELFTH	168 30	20 00	21 84			31 70	10 52	21 81	34 81	314 75	1022 03	86 04
Credit			2 40			31 70						
Loan												
Totals	\$2281 40	\$273 70	\$264 58	\$143 43	\$27 40	\$121 42	\$125 64	\$119 50	\$515 75	\$15386 30	\$27325 81	\$1978 32
Credits			25 10			201 48					48 30	

DETAIL OF HIGHWAY DISBURSEMENTS—YEAR ENDING MARCH 31, 1909—Continued

WARDS	Removing Snow	Sweeping Streets	Sprinkling Streets	Weeding, etc.	Cross-walk Main-ten- ance	Culvert- Main-ten- ance	Highway Bridge Main-ten- ance	Highway Steps Main- tenance	Water Troughs	Actual Disburse- ment	Budget Appropri- ation	Balance April 1, 1909
FIRST.....	\$ 156 08	\$ 51 51	\$ 1027 78	\$ 212 03	.....	.....	.....	.....	\$ 47 04	\$ 5523 12	\$ 7000 00	\$ 3331 32
Credit.....	39 65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SECOND.....	498 63	336 02	1125 19	4 20	5 55	.....	9 01	.....	.....	.....	7500 00	.....
Credit.....	166 84	.....	.....	.....	.....	.....	.....	.....	.....	7599 96	.....	49 41
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1900 00	.....
THIRD.....	151 11	49 96	1531 95	296 56	1 48	2 86	.....	.....	23 80	.....	7500 00	.....
Credit.....	29 17	.....	.....	.....	.....	.....	.....	.....	.....	8241 55	.....	396 93
FOURTH.....	357 67	285 02	1702 46	96 24	27 06	13 08	3 53	11 49	89 57	.....	7000 00	.....
Credit.....	111 08	14 50	.....	.....	.....	.....	.....	.....	.....	8454 33	.....	88 97
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2000 00	.....
FIFTH.....	213 81	174 66	1058 71	509 59	48 29	12 72	3 52	34 92	91 22	.....	7000 00	.....
Credit.....	28 99	5 78	.....	.....	.....	.....	.....	.....	.....	6334 18	.....	1453 49
SIXTH.....	202 46	83 55	1158 45	15 88	17 95	44 23	23 60	.....	42 35	*2000 00	8000 00	.....
Credit.....	92 18	.....	.....	.....	.....	.....	.....	.....	.....	5272 07	.....	783 88
SEVENTH.....	163 71	143 37	1116 95	14 44	7 55	.....	3 85	.....	43 39	*1400 00	5500 00	.....
Credit.....	76 03	.....	.....	.....	.....	.....	.....	.....	.....	5236 63	.....	174 73
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1400 00	.....
EIGHTH.....	146 36	132 88	663 83	1 08	1 72	.....	.....	.....	20 84	*700 00	3500 00	.....
Credit.....	73 45	.....	.....	.....	.....	.....	.....	.....	.....	3569 53	.....	291 29
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	900 00	.....
NINTH.....	148 96	78 87	1144 67	13 11	1 74	4 15	.....	.....	39 28	*1900 00	4500 00	.....
Credit.....	53 88	.....	.....	.....	.....	.....	.....	.....	.....	4018 87	.....	377 37
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1500 00	.....
TENTH.....	89 15	8 37	1590 21	394 01	.....	.....	.....	.....	44 65	.....	6000 00	.....
Credit.....	22 62	.....	.....	.....	.....	.....	.....	.....	.....	6246 74	.....	447 18
Loan.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500 00	.....
ELEVENTH.....	88 05	19 57	1627 22	454 39	.....	.....	45 36	.....	40 00	.....	5000 00	.....
Credit.....	11 62	.....	.....	.....	.....	.....	.....	.....	.....	4747 89	.....	2581 32
TWELFTH.....	123 91	17 57	1064 40	587 93	33 60	13 82	139 59	2 40	16 18	.....	4500 00	.....
Credit.....	39 88	14 90	.....	.....	.....	.....	.....	.....	.....	3648 69	.....	2107 78
Totals.....	\$2338 90	\$1371 35	\$14901 82	\$2600 46	\$144 94	\$90 86	\$228 46	\$48 81	\$498 42	*\$8000 00	*\$73000 00	.....
Credits.....	744 39	35 18	.....	.....	.....	.....	.....	.....	.....	\$68993 56	8300 00	\$11964 80

*Return of Loans.

DETAIL OF SEWER DISBURSEMENTS—YEAR ENDING MARCH 31, 1909

SEWERS	Commission- er Salary	Clerk's Salary	General Supplies	Rents	Telephone Rentals	Buildings	Stable Mainten- ance	Repairing Sewers	Cleaning Sand-traps	Flushing Sewers	Manhole Repairs	Actual Disburse- ments	Budget Appropri- ations	Balance April 1, 1908	Balance April 1, 1909
1st Sewer.. Credits..	\$138 00	\$37 50	\$13 00 2 00	..... .....	\$24 00	\$ 7 38	\$ 52 15	\$130 55 23 68	\$2679 99 3 00	\$ 906 59 10 63	\$48 57	\$ 3998 42	\$ 4000 00	\$1635 44	\$1637 02
2d Sewer.. Credits..	165 60	20 00	20 09	60 00	24 00	.....	64 13	199 37	2600 15 16 86	2174 42 27 62	10 25	5293 53	5000 00	66 63	Debit 226 90
3d Sewer.. Credits..	207 00	17 50	12 15	15 00	24 00	41 47	96 65	400 49	1507 51	634 47 3 10	.....	2952 14	6000 00	4992 58	3040 44 *5000 00
Totals..... Credits..	\$510 60	\$75 00	\$45 24 2 00	\$75 00	\$72 00	\$48 85	\$211 93	\$730 41 23 68	\$6787 65 19 86	\$3715 48 41 35	\$58 82	\$12244 09 ..	\$15000 00	\$6694 65	\$4447 56

*NOTE—This amount was loaned to the Highway Funds from the Third Sewer District Fund.

Respectfully submitted,

Jas. A. KINNEY,
Chief Clerk.

ANNUAL REPORT OF THE INSPECTION DEPARTMENT

GRAND RAPIDS, MICH., April 1, 1909

MR. SAMUEL A. FRESHNEY,
Secretary and General Manager.

DEAR SIR:—Herewith is presented the Annual Report of the Inspection Department for the year ending March 31, 1909:

WATER SERVICES

Number of schedule services.....	9,462
Number of metered services.....	6,828
Number of services to curb or lot line.....	1,060
Number of services for fire protection	166
Number of services for elevators.....	56
Number of services for watering troughs	58
	<hr/>
	17,125

DISTRIBUTED IN THREE DISTRICTS AS FOLLOWS:

NORTH DISTRICT

Schedule.....	3,368
Metered.....	2,226
To curb or lot line.....	503
	<hr/>
	6,097

SOUTH DISTRICT

Schedule	3,558
Metered	2,404
To curb or lot line.....	400
	<hr/>
	6,362

WEST DISTRICT

Schedule	2,810
Metered.....	1,698
To curb or lot line.....	157
	<hr/>
	4,665

Total number of tapping permits issued from April 1, 1908, to April 1, 1909.....	899
Total number of services cut off at main and abandoned.....	297
Total number of services discontinued and being served by Gr'd Rapids Hydr. Co..	287

Embodied in the following statement is a report of the work done by the inspectors employed in this department during the past year:

Number of house inspections made.....	9,400
Number of inspection and investigation notices served	16,923
Number of meter readings taken	40,500
Number of water services to curb inspected	389
Number of high reading meter notices served	1,062
Number of water waste notices served.....	620
Number of leaks found and owners notified	1,733
Number of services turned on.....	1,342
Number of services turned off.....	1,413
Number of fixtures capped and uncapped	29

METERS

In the following table are shown the number, kind and size of meters in service on March 31st, 1909.

METERS IN SERVICE

Name	½ in.	¾ in.	1 in.	1½ in.	2 in.	3 in.	4 in.	6 in.	Total
Naab	2863	95	56	4	13	.....	1	.....	4,034
Worthington	239	22	46	1	20	.....	1	.....	339
Crown	1250	171	72	9	28	1	3	.....	1,534
Thompson	2	2	.....	.....	1	.....	.....	.....	3
Trident	194	8	3	1	1	.....	.....	.....	207
Union	6	3	4	.....	.....	1	.....	.....	14
Duplex	12	.....	.....	.....	.....	.....	.....	.....	12
Gem .....	.....	.....	.....	.....	5	6	13	2	26
Heisey	12	9	16	.....	4	.....	.....	.....	41
Lambert	4	5	.....	.....	.....	.....	.....	.....	9
Empire	67	27	1	.....	13	.....	.....	.....	111
Keystone	1	.....	.....	.....	.....	.....	.....	.....	1
Standard	3	.....	.....	.....	.....	.....	.....	.....	3
American	3	.....	.....	.....	.....	.....	.....	.....	3
Badger	1	.....	.....	.....	.....	.....	.....	.....	1
Acorn	1	.....	.....	.....	.....	.....	.....	.....	1
	5656	342	196	15	87	6	18	3	6,305

On services where a meter has been installed no record is kept of the water fixtures.

WATER FIXTURES ON SCHEDULE SERVICES

Baths	3,306
Hopper closets	1,677
Tank closets	6,673
Basins	1,343
Kitchen sinks	4,718
Urinals	63
Yard Hydrants	4,966
Mill cocks	7,820
Hydraulic pumps	134
Water troughs	32
Sprinkling cranes	4
Miscellaneous fixtures	711
Total	\$ 23,569

Distributed as follows:

Wards	Baths	Hopper Closets	Tank Closets	Basins	Sinks	Uri- nals	Hy- drants	Sill Cocks	Hydral'o Pumps	Water Troughs	Sprink'g Cranes	Miscel- laneous	Totals
1st and 12th	202	145	456	200	381	1	708	606	4	6	.....	58	3767
10th and 11th	1070	451	1864	1022	1227	8	854	2414	104	11	.....	79	9104
3rd	787	400	1498	838	1091	4	599	1507	186	2	.....	306	7318
2nd, 4th and 5th	779	429	1673	784	1233	18	1247	1631	112	14	4	184	8198
6th and 7th	203	316	725	214	416	11	1001	821	23	14	.....	36	3331
8th and 9th	189	136	432	167	247	3	500	535	5	5	.....	26	2344
Engine houses	18	.....	24	18	23	20	12	35	.....	.....	.....	23	173
Parks .....	.....	.....	.....	.....	.....	.....	24	.....	.....	.....	.....	.....	24
Cemeteries .....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	10
Totals	3308	1877	6672	3243	4718	65	4965	7530	434	53	4	711	33569

HOUSE TO HOUSE INSPECTIONS

The house to house inspection work has been completed and during the past year a total of over 9,000 inspections were made. The result of this work has made many additions to the water rates and has been beneficial to the Water Works Department in various ways.

HOPPER CLOSET SERVICES.

Systematic inspections have been ordered of all services supplying hopper closets and whenever willful waste is found a meter will be installed.

The large number of inspections reporting such waste, already at hand, indicate that the number of water services metered will be greatly increased at the close of the fiscal year.

The five inspectors regularly employed in this department have performed their work, which is steadily increasing, faithfully and for the best interests of the department.

Respectfully submitted,

ADOLPH WURZBURG,

Chief Inspector.

REPORT OF THE SMOKE INSPECTOR

GRAND RAPIDS, MICH., April 1, 1909.

MR. SAMUEL A. FRESHNEY,

Sec'y and Gen. Mgr. Board of Public Works.

DEAR SIR:—Herewith is presented the Annual Report of the Smoke Prevention Department for the fiscal year ending March 31, 1909.

This department was established under section 125 of the City Charter, and is governed by the provisions of an ordinance as adopted and amended on December 26, 1905.

The position of Smoke Inspector was created by a special ordinance passed March 4, 1907.

During the past year we have accomplished very good results in this department, and have not as yet resorted to court prosecution to enforce the ordinance, as it has been conceded by others who have been successful in abating the smoke nuisance that an educational campaign is productive of the best results.

If the manufacturer or owner would but realize that abatement of the smoke nuisance would mean economy in operation, decrease his consumption of coal and at the same time do away with a nuisance which is damaging to health and property, he would not hesitate to take immediate steps to better his condition. The elimination of smoke is a business proposition, and it is conceded by many that the manufacturer or owner who at the present day allows black smoke to roll out of his stack is guilty of extravagance in operation. The sooner this proposition is looked at from this standpoint the sooner we will have a smokeless and clean city.

During the past year we have taken a record of the equipment, conditions and general data of 42 plants, and have added same to our indexed system.

We have made 617 smoke observation charts during the past year. A copy of the chart showing violation is furnished to owners of stacks when violation notice is served. These charts have been added to our indexed system.

Smoke Ordinance Violation Notices to the number of 42 have been served. In the majority of cases these notices were the means of securing the betterment of conditions.

The following table shows the total devices in operation at the creation of this office, the total in operation April 1, 1908, and the total in operation April 1, 1909.

TYPE OR SETTING	Apr, 15, '07	Apr. 1, '07	Apr. 1, '09
Automatic stokers.	11	16	19
Hand fired furnaces (patent)	2	14	22
Various steam jets.....	12	12	12
Brick Bridge walls.....	8	9	12
Using so-called smokeless coal ..	....	19	76
Heating from central station. ....	..	25	28
Using coke or hard coal ....	....	7	8
Ordinary settings.....	264	195	151
Totals.....	297	297	339

During the past year we have given considerable attention to the question of smoke nuisance from the railroad locomotives leaving, entering and switching in our city, and have secured 51 observation charts of same. The railroad officials are quite interested in this question and lend their best efforts in co-operating with the department. We believe that the smoke condition in the railroad districts has greatly improved during the past year.

The following is a resume of the past year's work, together with a comparison of previous report.

	1907-1908	1908-1909	Totals
Plants visited and recorded.....	297	42	339
Smoke charts taken.....	707	617	1324
Smoke violation notices served.....	56	42	98
Notices served owners of heating plants.	15	10	25
Number of automatic stokers installed..	5	3	8
Number of hand-fired stokers installed..	12	8	20
Owners induced to burn smokeless coal..	19	57	76
Owners induced to burn coke or hard coal	7	1	8
Smoke charts of locomotives taken ....	....	51	51
Brick bridge walls installed	1	3	4
Plants using heat from central station	25	13	38
Plants not equipped at end of year.....	195	151	Gain 44

The department has adopted the following method of determining the percentage of elimination of smoke from time to time. Our smoke charts are divided into five different steps or grades of smoke; viz: Black, Dark Brown, Light Brown, Faint and Clear.

The Clear represents a perfect condition, (which we are striving to obtain). The Faint we consider as (1), Light Brown as (2), Dark Brown as (3), and Black as (4), as an example: Black smoke for a period of 15 minutes will carry to the air as much carbon as Dark Brown will in 20 minutes, Light Brown in 30 minutes or as Faint will in 60 minutes, and multiplying the number of half-minute readings noted on the chart under each grade by the number used to designate such grade and adding them together will give the standing of the stack for the particular hour in which the observation chart was made, and by assembling 25 or 30 of

FORM OF SMOKE INSPECTOR'S REPORT CARD

Name VOIGT MILLING CO Location PEARL ST Ward EIGHTH
 Engineer F.R. DODD Permit No. 52

	NO.	KIND	SIZE	REMARKS
Boiler	1	BABCOCK AND WILCOX	150 H.P.	WATER TUBES 72 = 4" TUBES 1 = 36" DRUM HIGH PRESSURE COAL
Smoke Pipe		NOTHING		
Stack	1	STEEL	34" x 90'	

INSPECTION

DATE	INSPECTOR	CHART	% BLACK	% D BROWN	% L BROWN	% PAINT	% CLEAR	% ALL SMOKE	REPORT
1/27/08	607	"	41 2/3	4%	9%			527	VERY BAD
1/31/08	612	"	51 2/3	6 2/3	10			645	"
2/18/08	641	"	29%	3%	9%			395	"
3/20/08	696	"	35	14 1/6	24%			614	"
4/11/08	712	"	56 2/3	5%	10			702	"

INSPECTION

DATE	INSPECTOR	CHART	% BLACK	% D BROWN	% L BROWN	% PAINT	% CLEAR	% ALL SMOKE	REPORT
4/28/08	731	"	52 1/2	4%	10			633	VERY BAD
5/13/08	764	"	34 1/6	5%	11 2/3			481	"
5/14/08	772	"	37 1/2	5	10%			500	"
6/16/08	798	"	31 2/3	5	8 1/3			420	"
6/18/08	812	"	29 1/6	4%	5%			479	"
6/19/08	816	"	33 2/3	4%	9%			452	"
7/19/08	825	"	0	0	0			000	CLEAR
8/19/08	866	"	0	0	0			.8	EX GOOD
10/1/08	920	"	0	0	0		CLEAR		"
12/28/08	1036	"	0	0	0			1/10 OF 1%	"
1/25/09	1118	"	0	0	0			1/10 OF 1%	"
2/24/09	1172	"	0	0	5%			68	"
3/9/09	1205	"	0	0	0			1/10 OF 1%	"
3/12/09	1223	"	0	0	0			2.9	"
3/16/09	1246	"	0	0	0			4.1	"
3/25/09	1299	"	0	0	0		CLEAR		"



these charts and averaging them we secure a fair idea of the average condition of the stack.

The average of the charts taken each month are shown in the following table and improvement of conditions will be readily determined by comparing percentages:

Month.	1st Year. No. of Charts.	Percent- age.	2nd Year. No. of Charts.	Percent- age.
April .....	....	....	38	72.2
May.....	133	72.2	45	73.6
June.....	72	67.8	31	71.5
July.....	58	74.4	15	80.8
August.....	57	63.2	51	70.3
September.....	22	72.3	24	75.4
October.....	76	63.5	16	71.7
November....	75	70.7	78	82.1
December.....	61	69.0	34	89.0
January.....	60	68.7	105	80.6
February.....	62	75.5	45	82.4
March.....	31	66.9	135	88.3
Total of charts	707		617	
Average percentage of elimination each year on all charts made.....		69.8		80.4

As recommended in our previous report the Smoke Observation Tower in the City Hall has been put into service and has proven a very valuable position from which to secure observation. The telephone facilities have enabled us to get in touch with violaters when their conditions were bad and was the means of improving conditions to a great extent.

We feel that we have succeeded in bettering the smoke conditions during the past year and hope to have as good or better results to report in the future.

FINANCIAL STATEMENT

	Cr.	Dr.
Balance in fund March 31, 1908	\$ 783 47	
Budget appropriation	1,500 00	
Inspector's salary		\$1,200 00
Office supplies		17 13
Printing and blanks		39 64
Expenses to Convention		52 48
Observation Tower construction		98 63
Telephone rental		14 65
		<hr/>
		\$1,422 48
Balance in fund April 1, 1909		860 99
	<hr/>	<hr/>
	\$2,283 47	\$2,283 47
Balance in fund April 1, 1909	860 99	

Very respectfully submitted,

LOUIS C. TOWNER,
Smoke Inspector.

REPORT OF CITY ENGINEER

GRAND RAPIDS, MICH., April 1, 1909.

MR. SAMUEL A. FRESHNEY,

Sec'y and Gen. Mgr. Board of Public Works.

DEAR SIR:—Herewith is presented the Annual Report of the work done by the Engineering Department during the fiscal year ending March 31, 1909.

STREETS

2.085 miles of streets have been added to the total milage of 294.285 reported a year ago, making a total of 296.370 miles. 183.500 miles have been improved, 8.600 miles of which have been improved this year, leaving 112.870 miles, or about 38 per cent of the total miles, still unimproved.

STREET IMPROVEMENTS

Street improvement bonds to the amount of \$150,000.00 were issued during the year. The work contracted for during the year amounted to \$145,403.00.

The greater portion of the work was ordered and contracted for during the winter. Only a small amount of new rail was placed by the Grand Rapids Railway Company, the old rails being largely relaid. East Bridge Street and South Division Street improvements were somewhat delayed by conduits. The Council did not appropriate money until well into the season, and no other funds were available for ordering material and laying the conduits. Some of the gravel streets were delayed because of lack of water pipe. All of these streets were either practically completed, or left in good condition for the winter. All of the brick streets were completed with the exception of a portion of South Division Street, where work was delayed by the construction of the South End Sewer.

Metropolitan and Trimble Blocks were used in paving. Following the practice of previous years, all brick were inspected on the cars and generally a very uniform and good quality of brick was obtained.

As in past years, brick pavements were filled with cement grout, ex-

pansion joints being filled with the "Pioneer" asphalt filler. The type of joints was changed from that employed during previous years. About every 30 ft. to 50 ft. a $\frac{1}{4}$ in. by 4 in. strip was placed in a joint crosswise of the street and left there until the pavement was rolled and ready for grout. This strip was then removed and poured with the asphalt filler at the same time that the joint was poured along the curb. The remainder of the pavement was then filled with cement grout. Canal Alley pavement had all the joints filled with "Pioneer" filler, in order to open the pavement at once for traffic.

Portland cement concrete was used for all the foundations during the past season, the use of natural cement being abandoned.

New 'I' rails were laid by the Grand Rapids Railway Company in Monroe and East Fulton Streets from Division Street to Jefferson Avenue, and also in a portion of East Bridge Street. On the first named streets granite rail blocks were used specially cut to form a groove for the wheel flange. Specially moulded paving brick blocks were used on East Bridge Street.

Medina sandstone block were used in paving East Bridge Street from Ottawa Street to Ransom Street. Special care was taken to have the cement joint kept below the top of the stone, so as to form a good foothold for the horses. A part of this street has a nine per cent grade, but the method of laying the stone has proved satisfactory, and the teams seem to have no difficulty in drawing comparatively large loads up this steep grade.

Morris Avenue from Cherry Street to Wealthy Avenue was improved with macadam, using the same specifications under which College Avenue was improved the previous year.

Proceeding under the new charter provision, this department had direct charge of the repairing of the old improved streets. A large amount of money compared with preceding years was spent on repairing gravel streets, with the result that the streets were in excellent condition at the end of the season. Special attention was given to crosswalks, gravel being placed and rolled each side thereof, making the streets much better for travel. Asphalt repairs were continued, the Hooke Asphalt Repair Plant purchased the preceding season being used. The cost of the asphalt repair work was about half the former price per yard under the contract with the Barber Asphalt Paving Company. The cost of our repair work is shown in detail under the report of the Accounting Department.

The work completed and the new work contracted for during the past year is shown in the following table:

WORK LEFT OVER FROM 1907. COMPLETED IN 1908
PAVED WITH CONCRETE

STREETS	EXTENT	Width of Roadway	DIMENSIONS			COST		CONTRACTORS
			Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll	
Portsmouth Terrace	E. Fulton to Fountain	17.5	757	.	1540	\$ 2730.00	\$ 2085.00	Kloote & VanderVeen

MEDINA BLOCKS AND BRICK

E. Bridge St.	Ottawa to Barclay	46	1679	Old	9682	26600.00	37700.00	Kloote & VanderVeen
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GRADED, GRAVELED AND GUTTERS PAVED

Alexander Ave	S. East to Giddings Ave.	36	3861	7791	...	22475.00	23050.00	Kloote & VanderVeen
Barber Ave	N. Diamond to Houseman	31	566	1574	...	4082.00	4392.00	Albert Prange
Danham St	Dolbec to Fuller	30	1617	3352	...	9945.00	7115.00	Kloote & VanderVeen
Lincoln St	(Benjamin Terrace)	24	933	...	...	...	...	Thomas Benjamin
Clarks Ave	(Division to Jefferson)	24	890	1244	...	2680.00	5090.00	Fred Gilner
Hilltop St	Prescott to Fifth	26	2534	5734	...	4200.00	4920.00	VanderVeen & Mossell
Mass St	Second to Fourth Aves.	30	617	1367	...	4459.00	4771.00	Jas. B. Hoey
Phillips St.	Hall to Stevens	30	1104	2234	...	5892.00	6492.00	Wm. T. Johnston
Scott Av	W. Bridge to Oswego	24	1810	1077	...	5305.00	5635.00	Leonard C. Hilding

WORK LET FROM APRIL 1, 1908, TO APRIL 1, 1909

PAVED WITH BRICK ON CONCRETE FOUNDATION

STREETS	EXTENT	DIMENSIONS			COST		CONTRACTORS
		Width of Road	Length of Street	No. of Sq. Yards	Contract Price	Amount of Roll	
Buchanan St.	Washby to Prescott	24	680	1632	\$ 4076 00	\$ 4996 00	Wm. T. Johnston
E. First St.	La Fayette to Washby	19	364	696	5100 30	33684 00	Kloote & VanderVeen
S. Division St.	First Ave. to P. M. Ry.	42	44.5	0.3	41003 00	43218 00	Thos. P. McDermott
Canal Alley	Laurel to N. E. Place	10	739	1341	7350 00	4000 00	Jos. B. Hoey
GRADED AND PAVED WITH CONCRETE							
Cherry Alley	Clarry to Backeye	8	601	0.6	866 00	1022 00	Louis C. Kantz
GRADED AND MACADAMIZED							
Morris Ave.	Cherry to Wealthy	26	1235	2512	6300 00	7405 00	Kloote & VanderVeen
GRADED GRAVELED AND GUTTERS PAVED							
Ann St.	Canal to River	26	35.7	780	1570 00	1905 00	VanderVeen & Mossell
Canal St.	Ball Park Bldg. to Scott	26	275	535	1575 00	1735 00	Leonard C. Hiding
East 10th St.	Laurel to West	26	245	495	1290 00	1290 00	Hiding & Johnston
S. First St.	Shawmut to P. M. Ry.	26	123.3	2565	5740 00	6100 00	Kloote & VanderVeen
Garfield Ave.	W. Division to Shawmut	36	1082	4516	13500 00	12000 00	Thos. P. McDermott
Laurel St.	Washby to First Ave.	30	804	1807	3840 00	4490 00	Kloote & VanderVeen
Lowell Ave.	Prescott to La Fayette	23	121.7	2655	6700 00	7325 00	Kloote & VanderVeen
Ney St.	Market to Wealthy	26	500	1000	2945 00	3184 00	Fred Gainer
Shawmut Ave.	Valley Ave. west	26	150	300	785 00	885 00	Leonard C. Hiding

WORK LEFT OVER FROM 1907. COMPLETED IN 1908

PAVED WITH CONCRETE

STREETS	EXTENT	DIMENSIONS			COST		CONTRACTORS
		Width of Road-way	Length of Street	No. of Sq. Yards	Contract Price	Amount of Roll	
Portsmouth Terrace....	E. Fulton to Fountain.	17 5	737	1540	\$ 2780 00	\$ 3026 00	Kloote & VanderVeen

MEDINA BLOCKS AND BRICK

E. Bridge St.....	Ottawa to Barclay..	46	1679	Old	9082	32300 00	37760 00	Kloote & VanderVeen
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GRADED, GRAVELED AND GUTTERS PAVED

Alexander Ave.	S. East to Giddings Ave	35	3981	7791	22475 00	23050 00	Kloote & VanderVeen
Baraga Ave.	N. Diamond to Houseman	26	566	1278	....	4083 00	4893 00	Albert Prange
Dunham St.	Doibee to Fuller	25	1617	3352	....	6345 00	7145 00	Kloote & VanderVeen
Gertrude St.	(Benjamin Terrace)	24	833	....	....	....	....	Thomas Benjamin
Griggs Ave	Division to Jefferson.	24	899	1008	....	5680 00	6080 00	Fred Oliver
Hilton St	Prescott to Fifth Ave.	25	2054	3734	....	8920 00	9000 00	VanderVeen
New St.	Second to Fourth Aves.	25	617	1267	....	4450 00	4774 00	Jas. B. Hoey
Phillips St.	Rail to Stevens	20	1108	2338	....	5293 00	5482 00	Wm. T. Johnston
Scott Av	W. Bridge to Owego..	24	1800	1677	....	5395 00	5635 00	Leonard C. Hilding

WORK LET FROM APRIL 1, 1908, TO APRIL 1, 1909

PAVED WITH BRICK ON CONCRETE FOUNDATION.

STREETS	EXTENT	Width of Road- way	DIMENSIONS			COST		CONTRACTORS
			Length of Street	Length of Curb	No. of Sq. Yards	Contract Price	Amount of Roll	
Buchanan St ..	Wealthy to Prescott.	24	680	560	1650	\$ 4678 00	\$ 4898 00	Wm. T. Johnston
E. Bridge St....	Lafayette to Grand ..	42 48	2341	5196	14240	31600 00	33988 00	Kloote & VanderVeen
S. Division St.....	Fifth Ave. to P. M. Ry.....	42 46	4405	Old	22304	41683 00	43218 00	Thos. P. McDermott
Canal Alley.....	Lyon to N. E. Place.....	20	739	....	1541	3850 00	4000 00	Jas. B. Hoey

GRADED AND PAVED WITH CONCRETE

Cherry Alley.....	Cherry to Buckeye	8	661	605	898 00	1022 00	Louis C. Kanitz
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GRADED AND MACADAMIZED

Morris Ave.....	Cherry to Wealthy.....	26	1255	2512	6800 00	7405 00	Kloote & VanderVeen
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GRADED, GRAVELED AND GUTTERS PAVED

Ann St.....	Canal to River.....	26	383	780	1570 00	1805 00	VanderVeen & Mossell
Cayuga St.....	Ball Park Blvd. to Scott.....	26	275	535	....	1575 00	1735 00	Leonard C. Hilding
Eleventh St.	Jeunette to West.	26	2205	4635	....	12200 00	12700 00	Hilding & Johnston
S. Fuller St.....	Sherman to Fifth Ave	26	1253	2595	....	5740 00	6100 00	Kloote & VanderVeen
Garfield Ave ..	W. Bridge to Shawmut.....	36	1682	3516	....	12500 00	12900 00	Thos. P. McDermott
LaGrave St.....	Wealthy to First Ave.....	30	888	1997	....	3830 00	4030 00	Kloote & VanderVeen
Lowell Ave.....	Fulton to Lyon.....	26	1267	2655	....	6700 00	7525 00	Kloote & VanderVeen
Ney St ..	Market to Wealthy.....	26	560	...	....	2845 00	3194 00	Fred Gilner
Shawmut Ave...	Valley Ave., west.....	20	150	....	...	795 00	895 00	Leonard C. Hilding

MILEAGE OF STREETS

The mileage of streets in the City, and the length of each class of improvements are shown in the following table :

Graded and paved with sheet asphalt.....	5.588
“ “ “ “ block asphalt on gravel.....	1.215
“ “ “ “ “ “ “ concrete .....	.290
“ “ “ “ creosoted wood blocks on concrete ...	.350
“ “ “ “ brick on concrete.....	19.140
“ “ macadamized	6.985
“ “ paved with tar concrete.....	.102
“ “ “ “ cedar blocks on concrete.....	1.047
“ “ “ “ “ “ “ gravel .....	.628
“ “ “ “ Medina stone blocks on concrete .....	.256
“ “ “ “ Portland cement concrete.....	1.188
“ “ “ “ cobble stones on gravel.....	.528
“ graveled and gutters paved with cobble stones.....	79.075
“ “ “ “ “ “ “ brick and concrete	38.168
“ and graveled	29.000
Unimproved	112.870
Total	296.970

LIST OF STREETS PAVED WITH BRICK

The following is a list of the streets in the City that have been paved with brick, giving the date of paving, kind of brick and the material used for filling joints. A similar table of sheet asphalt pavements is also given. Many inquiries are made with reference to the age of the various pavements, and I believe the table will be of general interest.

STREET	EXTENT	Date	KIND OF BRICK	FILLER
Alabama St.....	Bridge to First.....	1901	Buckeye.....	Pitch.
Bridge St. Bridge	.....	1904	Trimble or Metropolitan	Pitch.
West Bridge St.....	River to Stocking.....	1891	Hallwood.....	Pitch.
West Bridge St.....	Stocking to Garfield.....	1905	Metropolitan.....	Cement grout.
East Bridge St.....	Canal to Ottawa.....	1897	Harris, Buckeye and Hallwood.....	Pitch.
East Bridge St.....	Barclay to Lafayette.....	1897	Buckeye.....	Cement grout.
East Bridge St.....	Lafayette to Grand.....	1908	Metropolitan.....	Cement grout.
East Bridge St.....	Lyon St. to Park.....	1907	Metropolitan.....	Cement grout.
Bostwick St.....	At Wealthy.....	1908	Metropolitan.....	Cement grout.
Buchanan St.....	Lyon to Pearl.....	1898	Harris.....	Pitch.
Campau St.....	Pearl to Louis.....	1898	Canton.....	Pitch.
Campau St.....	Louis to Fulton.....	1899	Metropolitan.....	Pitch.
Canal St.....	Bridge to Newberry.....	1900	Iron Rock.....	Pitch and cement grout.
Canal St.....	Leonard to Coldbrook.....	1898	Metropolitan.....	Pitch.
Canal St.....	Leonard to Travis.....	1905	Trimble.....	Pitch.
Carrier St.....	Plainfield to College.....	1907	Nelsonville.....	Cement grout
Cherry St.....	Ionis to Ottawa.....	1901	Metropolitan.....	Cement grout.
Cherry St.....	Madison to East.....	1901	Trimble, Buckeye and Metropolitan.....	Cement grout.
Cherry St.....	East to Carroll.....	1904	Trimble or Metropolitan.....	Cement grout.
North Commerce St.....	.....	1895	Hallwood.....	Pitch.
Crescent Ave.....	Canal to Division.....	1904	Hocking Valley.....	Cement grout.
Division St.....	Monroe to Fulton.....	1896	Harris.....	Pitch.
Division St.....	Fulton to Wealthy.....	1906	Metropolitan.....	Cement grout.
Division St.....	Wealthy to Fifth.....	1907	Metropolitan.....	Cement grout.
Division St.....	Fifth to P. M. R. R.....	1908	Trimble.....	Cement grout.
Ellsworth Ave.....	.....	1903	Wooster.....	Cement grout.
Erie St.....	Canal St. west.....	1906	Metropolitan.....	Cement grout.
Front Street.....	Allen to Shawmut.....	1894	Canton.....	Pitch.
Front Street.....	Bridge to Allen.....	1901	Metropolitan.....	Cement grout.
East Fulton St.....	Division to Jefferson.....	1894	Hallwood.....	Pitch.
East Fulton St.....	Division to Commerce.....	1898	Metropolitan.....	Pitch.
East Fulton St.....	Commerce to River.....	1901	Harris.....	Cement grout.
East Fulton St.....	Jefferson to Straight.....	1907	Metropolitan.....	Cement grout.

LIST OF STREETS PAVED WITH BRICK—Continued.

STREET	EXTENT	Date	KIND OF BRICK	FILLER
East Fulton St....	River to Jefferson....	1908	Trimble.....	Cement grout.
Geoffrey Ave.....	R. R. south.....	1901	Nelsonville.....	Cement grout.
Grandville Ave....	Barthlet to Hull.....	1903	Hocking Valley.....	Cement grout.
Ionia St.....	Prescott to Bridge....	1907	Metropolitan.....	Cement grout.
Ionia St.....	Monroe to Fulton.....	1907	Trimble.....	Cement grout.
Ionia St.....	Dakes to Wealthy.....	1907	Trimble.....	Pitch.
Island St.....	Division to Market.....	1905	Hallwood made at Athens.....	Pitch and cement grout.
Jefferson Ave.....	Fulton to Washington.....	1905	Hallwood.....	Pitch and cement grout.
Kent St.....	Lyon to Crescent.....	1907	Metropolitan.....	Pitch and cement grout.
Kent St.....	Crescent to Fairbanks.....	1905	Metropolitan.....	Pioneer asphalt.
Louis St.....	Champion to Fulton....	1905	Hallwood.....	Pioneer asphalt & cement grout.
Lake Ave.....	Champion to Fulton....	1907	Hallwood.....	Pitch.
LaGrave St.....	River to Wealthy.....	1907	Harris.....	Pitch.
West Leonard St..	Fulton to Wealthy.....	1907	Metropolitan.....	Cement grout.
Lyon St.....	River to Tremont.....	1907	Metropolitan.....	Cement grout.
Lyon St.....	Canal to Champion.....	1907	Harris.....	Pitch.
Market St.....	Canal to Division.....	1907	Harris.....	Pitch.
Monroe St.....	Monroe to Fulton.....	1903	Hallwood.....	Pitch.
Newberry St.....	Canal to River.....	1901	Hallwood.....	Pitch.
New England Pl..	Division to Ionia.....	1900	Union Block.....	Pitch.
Oakes St.....	Division to Ionia.....	1900	Buckeye.....	Cement grout.
Orchard Hill.....	Division to Ionia.....	1905	Metropolitan.....	Cement grout.
Ottawa St.....	Bridge to Fairbanks.....	1906	Metropolitan.....	Cement grout.
Ottawa St.....	Fairbanks to Coldbrook.....	1909	Metropolitan.....	Cement grout.
Ottawa St.....	Lyon to Monroe.....	1908	Metropolitan.....	Pitch.
Ottawa St.....	Monroe to Ionia.....	1908	Metropolitan.....	Pitch.
Ottawa St.....	Louis to Fulton.....	1907	Nelsonville and Trimble.....	Cement grout.
Ottawa St.....	Fulton to Island.....	1901	Trimble.....	Cement grout.
Pearl St.....	Ionia to Island.....	1907	Metropolitan.....	Pitch.
Pearl St.....	Ionia to Ottawa.....	1905	Metropolitan.....	Cement grout.
Serbuener St.....	Ottawa to River.....	1901	Harris.....	Cement grout.
Shawmut Ave.....	Bridge to Webster.....	1901	Hallwood.....	Pitch.
State St.....	Front to W. Division.....	1905	Trimble.....	Cement grout.
Stocking St.....	Canal to Ottawa.....	1904	Canal.....	Sand.
Trowbridge St....	At R. R.....	1903	Harris.....	Cement grout.
Williams St.....	Division to East.....	1901	Nelsonville.....	Cement grout.
Wealthy Ave.....	East to Eureka.....	1902	Trimble.....	Cement grout.
Wealthy Ave.....	Ionia to Eureka.....	1902	Nelsonville.....	Cement grout.
Wealthy Ave.....	Ionia to Ellsworth.....	1903	Harris.....	Cement grout.
Wealthy Ave.....	Ionia to Ellsworth.....	1905	Hocking Valley and Metropolitan.....	Cement grout.

LIST OF STREETS PAVED WITH SHEET ASPHALT.

STREET	EXTENT	Year	KIND OF ASPHALT	THICKNESS			CONTRACTOR
				Binder	Top	Conc'te Base	
Bridge St. E...	Canal St. West	1902	Trinidad Pitch Lake	1 in	2 in	6 in	Barber Asphalt Paving Company
Canal St.	Pearl to E. Bridge	1900	Trinidad Pitch Lake	1 in	2 in	.....	The Northern Paving & Cons. Co.
Cherry St.	Sheldon to Madison	1902	Trinidad Pitch Lake (resurfacing)	1 in	2 in	4 in	Western Paving & Supply Co.
College Ave S.	Wealthy to Pleasant	1893	Trinidad Pitch Lake	0	2 in	4 in	Warren-Scharf
Crescent Ave.	Bostwick to Union	1898	Trinidad Pitch Lake	1 in	1 1/4 in	5 in	Warren-Scharf
Foster's Drive	Across Foster Park	1891	Trinidad Pitch Lake	.....	2 in	4 in	Warren-Scharf
Fountain St..	Ottawa to Division	1897	Trinidad Pitch Lake	1 in	2 in	6 in	Warren-Scharf
Ionia St. N....	Monroe to Fountain	1906	Trinidad Pitch Lake (resurfacing)	1 in	2 in	6 in	Barber Asphalt Paving Company
Ionia St. N....	Monroe to Pearl	1894	Trinidad Pitch Lake	0	2 1/4 in	6 in	Warren-Scharf
Ionia St. N....	Pearl to Crescent	1897	Wasatch Utah Lime R ck.	1 in	2 in	6 in	H. M. Reynolds & Son
Ionia St.	Fulton Intersection	1907	Acme (California) (resurfacing)	.....	.....	6 in	City
Ionia St. S ..	Fulton to Lakes	1902	Trinidad Pitch Lake (resurfacing)	1 in	2 in	.....	Western Paving & Supply Co.
Jefferson Ave.	State to Cherry	1906	Trinidad Pitch Lake (resurfacing)	1 in	2 in	4 in	Barber Asphalt Paving Co.
Jefferson Ave.	Cherry to Wealthy	1897	Trinidad Pitch Lake (reurfacing)	.....	2 in	6 in	H. M. Reynolds & Son
Jefferson Ave.	Wealthy to Fifth	1899	Assyrian (Utah)	1 in	1 1/4 in	5 in	Ayers Asphalt Paving Co.
Lafayette St. S	Fulton to Cherry	1892	Standard California	0	2 in	4 in	Warren-Scharf
Madison Ave.	Cherry to Fifth	1897	Trinidad Pitch Lake	0	2 in	6 in	Ayers Asphalt Paving Co.
Ottawa St. N.	Lyon to E. Bridge	1899	Standard California	1 in	2 in	6 in	Ayers Asphalt Paving Co.
Parls Ave.....	Wealthy to Pleasant	1894	Standard California	0	2 in	6 in	Warren-Scharf
Par's Ave.....	Wealthy to Cherry	1898	Standard California Light	0	2 in	4 in	Warren-Scharf
Pearl St.	Ionia to Division	1897	Standard California	1 in	1 1/4 in	4 in	Ayers Asphalt Paving Co.
Prospect St. N	Fulton to Division	1897	Wasatch Utah Lime Rock	1 in	2 in	6 in	H. M. Reynolds & Son
Prospect St. S.	Fulton to Fountain	1899	Trinidad Pitch Lake	1 in	1 1/4 in	5 in	Warren-Scharf
Washington St	Fulton to Washington	1897	Standard California	0	2 in	4 in	Ayers Asphalt Paving Co.
Washington St	Jeff-rson to College	1896	Trinidad Pitch Lake	0	2 in	4 in	Warren-Scharf
Waverly Place	State to Cherry	1896	Trinidad Pitch Lake	0	2 in	4 in	Warren-Scharf

ROAD ROLLERS

The road rollers began work April 1st and ended December 1st. Two new rollers were purchased during the year from the Kelly-Springfield Road Roller Company. One roller is a 20,000 pound three wheel type to be used for street repair work. The other is a 16,000 pound tandem type of roller to replace the old No. 4, Heisler Roller, which was turned in as part payment on the new rollers. The 20,000 pound roller has been designated No. 6, and the 16,000 pound as the No. 4. Both rollers were used during the latter part of the summer and have proved very satisfactory.

We have been rather unfortunate during the last year in having the rolls on No. 1, No. 3 and No. 5 rollers give out at different times, which kept one roller in the repair shop most of the time. The rollers have been given the customary overhauling during the winter and are all in good condition for the season's work.

The receipts and expenditures for the past year with the detail expenditures for each roller follows:

REPORT OF ROAD ROLLER FUND
FOR FISCAL YEAR ENDING MARCH 31, 1909.

	Receipts	Disburse ment
Balance in fund March 31, 1908.....	\$5114 43	\$
Kelly No. 1 Roller.....	148 75	1890 00
Kelly No. 3 Roller.....	230 55	1405 70
Russell Roller.....	25 75	258 14
No. 4 Roller.....	1054 50	1177 73
No. 5 Roller.....	173 43	1282 03
No. 6 Roller.....	222 50	857 40
Receipts for rolling on improvements and sewers.....	5115 00	
Stock.....	4 74	61 90
Purchase of new rollers No. 4 and No. 6.....		2305 00
Building roller shed at water works station.....		36 45
Unloading coal wagons, moving rollers, cartage, etc.....		12 90
	\$12751 05	\$ 9649 20
	9649 20	
Balance in fund March 31, 1909.....	\$ 2902 45	
Accounts receivable on hand March 31, 1909		\$ 140 34
\$1,500 00 was paid by the general fund toward the purchase of new rollers No. 4 and No. 6.		

ROAD ROLLERS
ITEMIZED DISBURSEMENT—FISCAL YEAR ENDING MARCH 31, 1909

	Kelly No. 1 Roller	Kelly No. 2 Roller	Russell Roller	No. 4 Roller	No. 5 Roller	No. 6 Roller
MAINTENANCE—						
Labor—Shop.....	\$ 104 17	\$ 97 63	\$130 53	\$ 54 98	\$ 70 14	\$ 2 89
Labor—Engineering.....	3 00	3 00	5 00	11 00	6 00	5 00
Repair parts.....	69 64	88 86	19 59	4 13	96 00	6 32
Telephone.....	2 10	2 10	2 10	2 10	2 55	1 50
Padlock.....	1 85	50	.....	.....	27	1 21
Paint.....	50	.....	50	.....	1 35	.....
Carfare.....	10	15	35	40	55	20
Insurance.....	15 03	15 04	15 04	15 04	37 50	37 50
New wheels.....	525 00	.....	.....	.....	300 00	.....
Wagon tire.....	2 75	1 00	50	2 00	.....	.....
Canvas.....	.....	4 57	.....	.....	.....	.....
Repair braces, springs, etc.....	.....	4 12	.....	.....	.....	.....
Repair scraper.....	.....	3 32	.....	1 35	.....	.....
Telegrams.....	.....	1 16	.....	49	2 29	2 12
Freight.....	.....	32 11	16 06	.....	17 52	.....
Wagon pole.....	.....	.....	1 75	.....	1 25	.....
New rims.....	.....	.....	150 00	.....	.....	.....
Curtain.....	.....	.....	40	.....	5 18	.....
New supply wagon.....	.....	.....	.....	.....	.....	78 75
OPERATION—						
Labor—Running.....	\$ 712 96	709 58	343 60	799 92	448 25	462 23
Labor—Cleaning.....	38 00	31 25	18 00	56 00	19 75	15 00
Labor—Piloting.....	1 06	90	98	5 66	6 38	.....
Tools.....	1 32	20	.....	67	4 56	1 07
Coal.....	350 41	365 65	183 91	196 90	202 66	200 99
Kindling.....	22 42	19 80	6 84	12 98	12 28	11 40
Oil.....	8 00	8 70	5 40	3 12	8 26	5 11
Waste.....	4 48	4 80	80	2 00	3 52	2 40
Cartage.....	4 60	2 15	1 00	2 50	10 40	12 75
Livery.....	1 98	25	2 53	1 53	1 00	50
Boiler compound.....	8 15	4 83	2 10	84	1 58	78
Packing.....	3 06	.....	85	3 26	.....	7 02
Globes.....	.....	4 22	31	85	1 49	.....
Oil can.....	.....	.....	.....	.....	80	.....
Lanterns.....	.....	.....	.....	.....	1 49	2 75
	\$1890 60	\$1405 89	\$858 14	\$1177 73	\$1202 02	\$857 49

SEWERS

Five year sewer bonds to the amount of \$40,000.00 were issued during the year.

There were also issued \$100,000.00 worth of special sewer bonds applying especially on the South Front street sewer from Wealthy Avenue to Allen street. This contract was awarded to Mr. Charles J. Carpenter, contractor, who installed an up-to-date equipment consisting of locomotive crane with orange peel bucket, steel sheeting driven by movable pile driver with a Steam hammer, Blaw Collapsible Steel Centering, and a Ransom concrete mixer. After the installation of the equipment, the work moved along rapidly and in an excellent manner. No difficulties were experienced, except a stretch of cemented gravel, which was so hard as to make progress quite slow for several weeks. The work should be completed by the middle of the summer. This sewer will collect all sewage on the west side entering the river north of the outlet of the west side ditch sewer.

Mr. Thomas J. Peter, contractor for the south end sewer system, has been slowly but persistently pushing along work on this contract. The large amount of water encountered, together with the need of securing a water tight sewer has made the work somewhat difficult and slow. Mr. Peter was allowed to substitute for the reinforced concrete pipe with a cement joint, a terra cotta pipe with corrugated bell and spigot, the joints being made with cement gaskets. As far as this work has been tested, it showed very little leakage. This he has been able to stop by caulking from the interior with shredded lead.

Work on the west side ditch sewer has been pushed along slowly. A great deal of difficulty was encountered in overcoming the underground water pressure near Eleventh street where the work was abandoned by the contractor. A heavy steel tube 40 inches in diameter was sunk about 25 feet into the underlying gravel layer, cleaned of sand, and used as a sump. By installing a 12 inch centrifugal pump, we were able to relieve the pressure so as to complete the sewer through this section. The tube was connected permanently by 15 inch pipe with the bottom of the sewer, permitting the water to flow directly into the sewer and obviating chances of the pressure affecting the sewer in the future. A little over a quarter

of a mile of sewer remains yet to be completed. A statement of the cost of the expense since the city commenced work is shown in the following table:

**STATEMENT OF CITY'S EXPENSE IN COMPLETION OF THE
WEST SIDE DITCH SEWER FOR NATIONAL CON-
STRUCTION COMPANY TO MARCH 31, 1909.**

Telephone, telegraph and office.....	\$ 55 90
Labor.....	16154 86
Advertising and returning machinery.....	100 36
New equipment.....	1088 59
Equipment repairs	1062 26
Equipment supplies	114 67
Sheathing.....	1042 14
Forms	320 38
Fuel and power	1919 21
Tile, gravel, cement and castings.....	3657 03
Miscellaneous tools and supplies.....	159 70
Total	\$26481 48
Credits and extras.....	1994 10
Net cost.....	24487 38
Contract price	14230 77
Net loss.....	\$10256 61

SEWERS CONSTRUCTED DURING THE FISCAL YEAR ENDING MARCH 31, 1909

The following table gives the kind and cost of sewers constructed during the year.

STREET	EXTENT	KINDS				COST		CONTRACTOR	
		INCHES		LEAKS	Man- holes	Contract Price	Amount of Bill		
		Verified Pipe	Con- crete						Sanitary and combin'd	Storm
Brown Ave.	Buchanan to Division	12	.....	1305	.....	3	\$1154	\$1286	Peter DeWitt
California St.	Straight to W. Broadway	12	.....	109	.....	1	256	257	C. E. Williams
Canal Alley	Erie to Huron	15	.....	190	.....	2	1340	1430	VanderWeele Bros.
Creston Court	Plainfield to Grove	9	.....	403	.....	2	423	437	Jno. VanderWeele
Crosby Court	Crosby to Myrtle	9	.....	160	.....	3	567	607	Jno. VanderWeele
S. Division St.	Crofton to Griggs Ave.	8	.....	205	.....	1	3470	3666	Jno. VanEas
		10	.....	904	.....	4			
Eleventh St.	Jennette to West	9	.....	1075	.....	4	4549	4723	Richard Pickett
Finney		15	.....	231	.....	1			
		20	.....	631	.....	5			
Wealthy Ave.		9	.....	758	.....	4	1868	1400	Jno. VanderWeele
First St.		8	.....	75	.....	1			
		12	.....	98	.....	2	814	906	C. E. Williams
N. Front St.	Wealthy Ave. north	12	.....	223	.....	2	675	775	Peter VanEas
Freyling Court		8	.....	265	.....	3			
		8	.....	941	.....	2			
P. Fulton St.	Coldbrook Creek—City Lim- its	10	.....	534	694	2	5676	6890	John J. Rens
		20	.....		266	1			
		24	.....			4			
Lowell Ave.	P. Fulton to Lyon.	8	.....	1296	600	4			
Hall St.		12	.....	266	.....	3	2006	2940	John VanEas
Bedlans St.	Hilton to Grandville	9	.....	417	.....	1	945	201	Peter DeWitt
Lafayette St.	Wenham to First Ave.	9	.....	250	.....	1	210	410	Jno. VanderWeele
Laurel Court	Grandville Ave. east	9	.....	103	.....	1	229	464	Jno. VanderWeele
Law Court	Lafayette to Terrace	9	.....	285	.....	1	341	386	Jno. VanderWeele
N. Pine St.	Twelfth to W. Leonard	9	.....	540	.....	3	267	1088	Jno. VanderWeele
Third St.	Lincoln to Pine	9	.....	870	.....	1	905	1080	John J. Rens
		9	.....	285	.....	3			

FLOOD WORK

Progress on the various flood work contracts is shown as follows:

Contract 1, (see last report). G. W. Bunker & Co. All concrete work completed and all river excavation, except about 6,000 cubic yards of rock excavation.

Contracts 2, 3 and 4 completed.

Contract 5 (see last report). Albert Prange, contractor. This work has dragged badly and should have been finished last summer. After working most of the past winter, there still remains to be completed the wall at the Pere Marquette bridge, and the river excavation adjacent thereto, rebuilding of the west wall of the lighting plant, cleaning up river bed excavation, dressing slopes, graveling market roadways and laying concrete platforms.

Contract 6. Silver Creek revetment walls were completed early in the season.

Contract 7. Thirty H. P. induction motor was furnished by the Fort Wayne Electric Company, and was installed temporarily to operate the 12 inch pump on the west side ditch sewer.

Contract 8. Moving dog pound. Vandenberg & Hulbert, contractors. The building was torn down and rebuilt by contractors on new foundation constructed by the city near lighting plant. The work was completed in time for use by the police department during the past season.

Contract 9. Fuller street culvert. Wiersma & Larmer, contractors. Was completed early in the season.

Contract 10. West side ditch sewage pumping station. Joseph P. Rusche, contractor. This contract was awarded late in the fall. The contractor was delayed somewhat waiting for detail plans of pump foundations and suction well. These were furnished as soon as possible after the contract for pumps was closed. The building will be completed early in May.

Contract 11. Motors for four sewage pumping stations. Westinghouse Electric & Manufacturing Company, contractors. This contract consists of four 175 H. P., two 75 H. P., two 60 H. P., three 30 H. P., one 6 H. P. and three $2\frac{1}{2}$ H. P. motors for driving centrifugal pumps and air pumps for priming. The motors are constant speed induction type for 440 volt, 3 phase, 90 cycle current. The 175 and one 30 H. P. motors are gear connected to pumps. The other large motors are direct connected. The four motors for air pumps are belt connected.

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CANAL STREET SEWAGE PUMPING STATION.

The contract included switchboards and all instruments complete and the entire equipment to be erected in place. The contract price was \$16,269.00. The contract provided for erection by March 15 of the equipment in the west side ditch and Canal street stations. This was delivered before the stations were completed. The remainder of the contract is to be completed on or before September 1, 1909.

Contract 12. Centrifugal pump and priming pump for four sewage pumping stations. Buffalo Steam Pump Company, contractors. This contract included four 40 inch, four 24 inch and two 18 inch centrifugal pumps together with four priming pumps, and all suction and discharge piping. The pumps are of the horizontal type, split on horizontal center of shaft to permit of top being removed without disturbing shaft.

The equipment for the west side ditch and Canal street stations was delivered March 1, 1909, as specified. The contract price is \$27,890.00, F. O. B. Grand Rapids.

Contract 13. Sluice gates for Canal street station. Roe-Stephens Mfg. Co., contractors. This contract consists of two 48 inch rectangular, and one 60 inch circular gates, which were furnished on time.

Contract 14. Canal street sewage pumping station. C. E. Williams, contractor. This contract was awarded January 2nd, 1909. The work has not progressed as rapidly as desired and will not be completed on time.

Contract 15. Hand operated cranes for four sewage pumping stations. Quincy-Manchester-Sargent Company, contractors. The contract consists of one 6, two 4 and one 3 ton cranes. The two for the west side ditch and Canal street station were delivered before needed. Contract price, \$1,553.50, F. O. B. Grand Rapids, Michigan.

Contract 16. Transporting and erecting pumps, piping and cranes in west side ditch and Canal street sewage pumping stations. Louis Franz, contractor. The contractor has handled the equipment promptly on receipt and erected it as fast as progress on buildings would permit. Contract price, \$553.00.

Contract 17. Transformers and switches for four sewage pumping stations. Wagner Electric Company, contractors. Contract price, \$6,100.00 F. O. B. Grand Rapids, Michigan.

Right of way has been secured and plans and specifications practically completed for constructing dock line wall on the west side of Grand River from Fulton street to Wealthy avenue, and the deepening of the river bed west of the United States government channel along the same stretch.

Rights of way have been agreed to and the agreements largely exe-

cuted for the construction of an embankment south of Wealthy avenue along the west dock line to west of the Grand Rapids-Muskegon Power Company's property, thence north to the Lake Shore and Michigan Southern Railroad.

On the east side of the river right of way has been secured from Huron street to the west line of the Coit Estate's property south of Wealthy avenue, with the exception of two parcels south of Wealthy avenue and six parcels north of the City Market. Some of these will have to be condemned.

Agreements were about completed looking to the abandonment of the East Side Power Canal and the centralizing of all the power in one station near the dam, where the West Side Power Company requested permission to combine their interests with the east side. This would be along the lines recommended by Mr. Conley, and would provide for a new dam just above Bridge street, and the deepening of the river bed from below the dam to Fulton street. The execution of this plan will mean much to the future development of Grand River and the improvement of the water front.

The cost of flood work to March 31st, 1903, in detail and total is given in the following tables:

ITEMIZED DISBURSEMENTS

GRAND RIVER—NORTH END

Flood gate repair-labor	\$	1 23	
Flood gate repair-material		3 04	
	\$	4 27	
Credit sale of stone			\$20 00

INDIAN MILL CREEK ALPINE.

Superintendence and general	21 07
Wrench	30
Engineering	7 03
Fence-labor	14 00
Fence rails	30 00
Lumber	1 70
Carriage	1 35
Livery	30
Fuller & Rice dam-engineering	1 00
Fuller & Rice dam-carfare	15
	87 35
Credit material sold	

CONTRACT NO. 1--Bunker

Payments on contract....	\$325 00	00
Engineering	506 00	
Inspection	600 04	
Carfare	30 45	
Six inch pipe and specials	9 33	
Waders	12 00	
Babbitt and machine work	14 00	
	\$2796	61

CONTRACT NO. 2-Bunker.

Payments on contract.....	\$ 7370 53
Engineering	230 00
Inspection.....	94
Carfare	11 83
Veneer works-flood gate-steel boxes.....	28 00
Veneer works-flood gate-plates, rollers and bolts.....	61 52
Veneer works-flood gate-labor.....	688 74
Veneer works-flood gate-gates.....	175 00
Veneer works-flood gate-annealed wire.....	2 25
Veneer works-flood gate-gear casting.....	1 75
Veneer works-flood gate-planks.....	13 62
Veneer works-flood gate-hoisting machinery.....	101 30
Yarn and sacks.....	2 98
Repair shop	2 00
Rent of pumps.....	33 47
Rent of tar kettle.....	2 00
Valve boxes.....	10 32
Lumber.....	76 70
Gravel and filling.....	50 05
Telegram	53
Sewer through wall at 388 Front street-labor.....	38 20
Cartage.....	19 35
Cement	22 98
Oil, valves, waste, etc.....	10 35
Nails, bolts, washers, etc.....	9 13
Wood	3 00
Coal.....	13 43
Boring valve seats.....	1 25
	<hr/>
	\$ 8890 33

Credit Veneer-Works-flood gate-labor..... \$1 57

CONTRACT NO. 3-Bunker.

Payments on contract.....	\$14209 98
Engineering.....	223 00
Inspection	109 62
Carfare	12 50
Six inch and 10 inch tile.....	5 06
One 12 inch valve and 12 inch pipe.....	41 95
Valve boxes.....	26 59
Rent of boat.....	2 25
Cartage.....	70
Repair shop.....	67
	<hr/>
	\$14632 32

CONTRACT NO. 4-Rusche.

Payments on contract.....	\$17057 87
Engineering.....	230 00
Inspection	199 86
Carfare	13 95
Fox Type Co. fire protection-labor.....	75 09
Fox Type Co alteration in wall right of way.....	28 69
Inspection on steel material.....	4 28
Repair shop	67
Pipe and ells.....	4 16
Brass screen for water pipe.....	4 00
Six inch and 10 inch pipe, bends, tees, etc.....	109 65
Plumbing.....	130 00
Repair tar walks.....	4 63
Cartage	2 50
	<hr/>
	\$17855 44

CONTRACT NO. 5-Prange.

Payments on contract.....	\$40522 00
Deductions	89 62
Engineering	821 00
Inspection	631 88
Carfare	40 50
Changing hydrants-labor.....	76 58
Changing hydrants-material.....	31 73
Inspection on steel material.....	18 74

CONTRACT NO 5—Prange—Continued.

Taking down platforms-labor.....	\$	9	98
Cleaning up-labor.....		3	88
Market-sewer and water-labor.....		123	56
Market-sewer and water-material.....		250	21
Market-sewer and water-repair shop.....		1	67
Market fence-labor.....		60	00
Market fence-material.....		1	78
Market intake-labor.....		10	54
Market intake-cement.....		1	75
Test holes-labor.....		171	20
Test holes-material.....		21	40
Lumber.....		234	24
Sinking test holes on island (Rusche).....		50	15
Oak piles.....		251	05
Auger.....			90
Nails.....		2	25
Cartage.....		16	52
Casting.....		1	50
Express.....			40
Brick.....		4	00
Labor.....		44	70
Steel chute.....		12	85
Flat grates.....		36	00
Rent of pump.....		48	00
Rent of boat.....		1	95
Telephone.....			65
Garbage burner-sewer and water-labor.....		67	75
Garbage burner-sewer and water-curb.....		5	20
Lighting plant-labor.....		55	98
Moving equipment-labor.....		51	63
Lead, bends and yarn.....		12	97
Repair shop-machine work.....		2	74
Livery.....			75
			<hr/>
			\$43790 95
Credit cement.....			

61 30

CONTRACT NO. 6—Silver Creek Revetment Wall.

Payments on contract.....	\$	300	00
Engineering.....		3	00
Inspection.....			75
Carfare.....			45
Livery.....			23
			<hr/>
			\$ 304 43

CONTRACT NO. 8—Moving Dog Pound.

Payment on contract.....	\$	1500	00
Inspection.....		97	87
Labor-foundation.....		27	08
Labor-repair shop.....		3	58
Labor-filling.....		43	92
Labor-sewer.....		13	44
Labor-sharpening picks.....		1	45
Material-sewer.....		29	24
Material-foundation.....			40
Material-water service.....		52	67
Engineering.....		8	00
Carfare.....			06
Hose bibb.....			90
Cartage.....		2	85
			<hr/>
			\$ 1870 53
Credit sale of lumber.....			

1 80

CONTRACT NO. 9—Fuller Street Culvert.

Payments on contract.....	974	00
Inspection.....	48	30
Engineering.....	9	00
Carfare.....		45
		<hr/>
	\$	1081 75

CONTRACT NO. 10—West Side Ditch Pumping Station.

Land.....	\$ 700 00
Payments on contract.....	4375 00
Deductions	6 80
Engineering.....	649 75
Carfare.....	17 65
Advertising	46 14
Inspection.....	117 94
Gate	323 09
Gate freight.....	9 00
Labor-test holes.....	173 61
Labor-catch basins	14 24
Gravel.....	1 47
Wedge.....	45
Cartage.....	19 45
Telephone	2 14
Pipe, bends, etc.....	103 63
Telegrams.....	6 16
Repair shop.....	39
Bolts, nuts, etc.....	4 78
Blue prints.....	3 35
Printing.....	11 19
Pressure pipe	51 11
	<hr/>
	\$ 6637 33

CONTRACT NO. 12—Sewage Pumping Stations-Pumps.

Payments on contract.....	\$ 4125 00
Traveling expenses.....	358 75
Machinery inspection.....	456 66
	<hr/>
	\$ 4940 41

CONTRACT NO. 13—Canal Street Pumping Station-Sluice Gates.

Payments on contract.....	\$ 1170 50
Traveling expenses	4 86
Advertising	16 17
Telephone.....	75
	<hr/>
	\$ 1192 28

CONTRACT NO. 14—Canal Street Pumping Station.

Payments on contract.....	\$ 2556 00
Engineering.....	470 75
Carfare	13 10
Drawings and specifications.....	77 40
Inspection.....	149 89
Advertising	69 90
Labor-test holes.....	11 17
Material-test holes	2 61
Repair shop.....	5 29
Telephone	2 15
Telegrams	6 90
Valve	2 47
Cartage.....	2 75
Nuts, bolts, etc.....	3 29
One 2 inch tee	30
Blue prints.....	3 35
Printing	11 18
	<hr/>
	\$ 3388 50

CONTRACT NO. 15—Sewage Pumping Stations—Traveling Cranes.

Advertising.....	\$ 35 07
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CONTRACT NO. 16—Transporting and erecting pumps, piping and cranes for west side ditch and Canal street pumping stations.

Payments on contract.....	\$193 20
Advertising.....	16 17
	<hr/>
	\$209 37

CONTRACT NO. 17—Sewage Pumping Stations—Transformers.

Advertising.....	\$37 57
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S. FRONT STREET SEWAGE PUMPING STATION.

Engineering.....	\$174 75
Carfare	3 05
Traveling expenses.....	15 05
Advertising.....	20 97
Telephone	1 04
Telegrams.....	3 55
Blue Prints.....	3 35
Printing.....	11 19
	<hr/>
	\$341 56

EAST SIDE SEWAGE PUMPING STATION.

Land—Right of way.....	\$195 93
Engineering.....	271 75
Carfare	2 20
Advertising.....	20 97
Labor—Test holes.....	37 00
Telephone	1 02
Telegrams.....	3 55
Blue Prints.....	1 70
Printing.....	11 19
	<hr/>
	\$552 31

PLANT ACCOUNT.

Rent of air plant building.....	\$80 00
Crusher repair on Island—Labor.....	25 25
Crusher repair on Island—Material	43 47
Pipe connections for pump—Contract No. 3.....	5 98
Machine bolts and nails—Contract No. 2.....	58
Machine work—Contract No. 3.....	55
Cartage.....	2 55
Labor—Moving equipment	9 45
Labor—Repairing toolhouse at Water works	90
	<hr/>
	\$151 77

Credit—Sale of equipment.....		\$456 50
Credit—Sale of harness.....		40 00
		<hr/>
		\$496 50

FULTON ST. TO WEALTHY AVE.—West Side.

Engineering.....	\$751 00
Carfare	10 50
Test holes—Labor.....	64 61
Valve ring.....	1 42
Cartage.....	2 20
	<hr/>
	\$839 73

WEALTHY AVE. SOUTH—West Side.

Engineering.....	\$145 00
Carfare ...	3 95
Materials.....	18 27
Labor—Test holes.....	416 02
	<hr/>
	\$583 24

WEALTHY AVE. SOUTH—East Side.

Engineering.....	\$93 00
Carfare	4 95
Labor—Test holes.....	67 21
Cartage.....	8 45
Right of way	800 58
	<hr/>
	\$974 18

FULTON ST. TO POWER DAM.

Engineering.....	\$150 00
Carfare	2 55
Bags	2 50
Cartage.....	2 00
Labor—Test holes.....	145 34
	<hr/>
	\$302 39

**LAKE SHORE & MICHIGAN SOUTHERN RAILROAD EMBANKMENT—
Closing Culvert.**

Engineering.....	\$8 00
Carfare	45
Labor	30 63
Gate and materials.....	156 08
Freight.....	4 87
	<hr/>
	\$209 03

EMBANKMENT—Butterworth Ave. to Lake Shore & Michigan Southern Railroad.

Engineering.....	\$58 00
Carfare	3 05
	<hr/>
	\$61 05

PLASTER CREEK—Straightening.

Engineering.....	\$3 00
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COLDBROOK CREEK—Straightening.

Engineering	\$3 00
Carfare	30
	<hr/>
	\$3 30

NORTH OF POWER DAM—East Side.

Engineering.....	\$ 17 00
Carfare	1 35
Labor.....	118 98
Materials.....	62 07
Cartage.....	3 25
	<hr/>
	\$202 65

FLOOD PROTECTION—Miscellaneous.

Engineering.....	\$55 00
Carfare	1 25
Rent of boat....	4 10
Labor.....	6 98
Cartage	5 45
Cleaning Ann St. Cable.....	6 90
Transfer.....	7 51
	<hr/>
	\$87 19

CREDITS—

Unclaimed labor checks ...	\$57 96
Labor.....	18 26
Cleaning Ann St. Cable.....	6 90
Transfer—Incorrect entry.....	7 51
	<hr/>
	\$90 63

COST OF FLOOD WORK—SUMMARY MARCH 31, 1909

	Fiscal Year 1904-5	Fiscal Year 1905-6	Fiscal Year 1906-7	Fiscal Year 1907-8	Fiscal Year 1909-9	TOTAL
Flood relief No. 1.....			\$ 1,992 11	\$ 1,089 04	\$ 4 26	\$ 3,085 41
Widdcomb embankment.....	\$ 9,882 13	\$ 4 60	2,087 61	4,473 82		16,448 16
Grand River—North end.....		28,331 27	58,298 44	5,383 53		92,006 24
Indian Mill Creek—Alpine.....			28,313 27	41,823 26	87 35	65,123 98
—Broadway.....			13,336 59	2,046 53		15,383 42
—Contract.....		3,005 33	2,787 96			5,793 29
Turner Street Bridge.....		5,369 70	1,024 85			6,394 55
Contract No. 1—G. W. Bunker & Co.....				19,115 25	37,766 41	56,881 76
2—G. W. Bunker & Co.....				15,074 82	8,890 83	23,965 15
3—G. W. Bunker & Co.....				4,924 06	14,632 32	19,556 38
4—J. P. Rusche.....				102 37	17,855 44	17,957 81
5—Albert Prange.....				245 46	43,790 96	44,136 41
6—Silver Creek revetment.....				1,563 24	304 42	1,867 76
7—West Side ditch motor.....				521 30		521 30
8—Moving dog pound.....				685 44		2,505 97
9—Fuller Street culvert.....				34 79		1,066 54
10—West Side ditch pumping station.....					1,870 53	6,637 33
12—Sewage pumping stations—Pumps.....					4,940 41	4,940 41
13—Canal Street pumping station—Sluice gates.....					1,192 28	1,192 28
14—Canal Street pumping station—Building.....					3,348 50	3,348 50
15—Sewage pumping stations—Cranes.....					35 07	35 07
16—Transporting and erecting pumps, piping and cranes.....					209 37	209 37
17—Sewage pumping station.....					37 57	37 57
South Front Street pumping station.....				475 00		716 56
East Side pumping station.....					552 31	552 31
Fulton Street to Wealthy Avenue—West side.....					829 73	829 73
Wealthy Avenue south—West side.....					543 24	543 24
—East side.....					974 18	974 18
Fulton Street to Power Dam.....					305 39	305 39
L. S. & M. S. Ry. embankment.....					209 03	209 03
Embankment—Butterworth Avenue to L. S. & M. S. Ry.....					61 06	61 06
Plaster Creek.....					3 00	3 00
Coldbrook Creek.....					3 30	3 30
North of Power Dam—East side.....				935 32	202 65	1,137 97
Plant account.....				22 73	151 77	174 50
Protection—Miscellaneous.....				1,046 17	87 19	1,133 36
—General.....				2,811 08		2,811 08
INTEREST.....				5,630 63	37 50	5,668 13
Receipts and credits.....	\$ 9,882 13	\$ 36,710 90	\$102,735 83	\$104,054 44	\$146,916 19	\$404,299 49
		734 19	15,951 16	8,037 11	729 42	25,455 86
Net cost.....	\$ 9,882 13	\$ 26,976 71	\$ 86,784 67	\$112,017 23	\$146,146 77	\$379,443 61

REPORT OF FLOOD WORK FUND

FOR FISCAL YEAR ENDING MARCH 31, 1909.

	Receipts	Disbursements
Balance in fund March 31, 1908.....	\$ 51,100 27	
Bonds and accrued interest.....	301,986 43	
Flood Relief No. 1.....		4 26
Grand River—North end.....	88 00	
Indian Mill Creek—Alpine.....	49 42	87 35
Contract No. 1—G. W. Bunker & Co.....		37,766 41
2—G. W. Bunker & Co.....	1 57	8,890 33
3—G. W. Bunker & Co.....		14,632 32
4—J. P. Rusche.....		17,855 44
5—Albert Prange.....	1 50	43,790 95
6—Silver Creek revetment wall.....		304 42
8—Dog Pound moving.....	1 80	1,870 53
9—Fuller Street culvert.....		1,031 75
10—West Side ditch pumping station.....		6,637 33
12—Sewage pumping stations—Pumps.....		4,940 41
13—Canal Street pumping station—Sluice gates..		1,192 28
14— " " " " ".....		3,388 50
15—Sewage pumping station—Cranes.....		35 07
16—Transporting and erecting pumps, piping and cranes.....		209 37
17—Sewage pumping stations—Transformers.....		37 57
South Front Street pumping station.....		241 56
East Side pumping station.....		552 31
Fulton Street to Wealthy Avenue—West side.....		829 73
Wealthy Avenue, south—West side.....		583 24
south—East side.....		974 18
Fulton Street to Power Dam.....		305 39
L. S. & M. S. Ry. embankment.....		209 03
Embankment—Butterworth Avenue to L. S. & M. S. Ry.....		61 05
Plaster Creek.....		3 00
Coldbrook Creek.....		3 30
North of Power Dam—East side.....		202 65
Plant Account.....	496 50	151 77
Protection—Miscellaneous		87 19
Bond interest.....		37 50
Credits—Miscellaneous.....	90 63	
Bond Exchange.....	6 39	
	<hr/>	
	\$353,822 51	\$146,916 19
	146,916 19	
	<hr/>	
Balance on hand March 31, 1909.....	\$206,906 32	
Accounts Receivable on hand March 31, 1909.....		\$ 1,200 30

TEMPORARY FLOOD WORK

Early in 1908 a boom at Ann Street, consisting of a heavy wire cable and timber booms, was placed across the river. On the first movement of ice, the boom timbers, which were old, broke loose from the cable and a large portion of the timber was lost. This boom was placed at the urgent request of property owners above the dam, without this Department anticipating that any material satisfactory results would be secured. It was early demonstrated that the boom would permit the ice to move as soon as the pressure was sufficient to lift the timbers, and this proved to be the case.

The annual rise in the river occurred about the middle of March, when temporary 12-inch pumps at the West Side Ditch, near Butterworth Avenue and the Front Street sewer, were started and operated during high water. The surface water having run off before the rise in the river came, no difficulty was experienced in keeping the section above free from back water.

The cost of this work is given in the following table under Flood Relief Fund.

REPORT OF FLOOD RELIEF NO. 2 FUND		
FOR FISCAL YEAR ENDING MARCH 31, 1909.		
	Receipts	Disbursements
Overdraft March 31, 1908.....		\$ 237 33
Receipts—Sale of sand bags.....	\$ 5 00	
Loan from General Fund Feb. 19, 1909.....	1,758 08	
Disbursements—		
Engineering.....		120 00
Car fare.....		12 85
Flood Gates, Front and Blumerich—Coal.....		72 20
—Parts for pump.....		1 02
—Labor.....		77 56
Flood Gates, Butterworth and ditch—Coal and wood..		57 01
—Labor.....		320 90
—Tar paper.....		3 00
—Pulley, etc.....		2 25
—Lumber.....		30 26
—Cement, brick and tile..		11 34
—Current.....		119 01
—Repair.....		14 00
—Parts.....		81
Ann Street boom—Labor.....		18 26
—Removing cable—Labor.....		4 00
—Cartage.....		2 70
—Cleaning cable—Labor.....		6 90
Preparation—Sacks and twine.....		170 55
—Labor.....		131 86
—Livery.....		7 50
—Cartage.....		90
—Sand.....		2 70
Express.....		1 85
Valve cover..		1 50
Parts.....		6 06
Telegrams.....		71
Oil, waste, grease and lanterns.....		15 91
Parts for sluice gates.....		4 00
Padlock.....		75
Cartage.....		25 30
Rusche contract for pumping (flood of March, 1908).....		107 07
Repair West Side Ditch Gates—Labor.....		66 46
Wiring motor at West Side Ditch.....		54 71
	\$1,753 08	\$1,750 96
		1,750 08
Overdraft March 31, 1909.....		\$ 8 90

TABULATION SHOWING GAGE READINGS

FROM APRIL 1, 1908, TO MARCH 31, 1909.

Day	April	May	June	July	August	Sept.	October	Nov.	Dec.	Jan'y	Feb'y	March	Day
1	10.20	3.63	7.40	.22	.58	.55	.50	Sunday	.58	Omitted	.75	7.87	1
2	9.75	2.82	7.33	.23	.70	.60	.60	.60	.42	"	.25	8.05	2
3	9.10	Sunday	6.45	.07	.77	.60	.55	.65	.10	"	.55	7.97	3
4	8.40	2.45	5.75	Holiday	.62	.60	Sunday	.55	.10	"	.80	6.87	4
5	Sunday	2.20	4.70	Sunday	.65	.60	.60	.55	.00	.40	.90	5.95	5
6	6.90	2.00	4.00	.10	.55	Sunday	.62	.58	Sunday	.20	4.01	5.07	6
7	6.15	2.05	Sunday	.25	.55	Holiday	.55	.57	.40	.00	Sunday	Sunday	7
8	6.35	3.85	2.65	.20	.55	.70	.63	Sunday	.50	.30	5.50	4.65	8
9	6.55	5.00	2.33	.37	.60	.70	.62	.55	.40	.30	3.90	4.60	9
10	6.70	Sunday	1.70	.35	.60	.75	.57	.67	.40	Sunday	2.75	4.75	10
11	6.58	5.45	1.30	.38	.65	.75	Sunday	.50	.55	.30	3.25	4.75	11
12	Omitted	6.20	1.10	Sunday	.65	.78	.65	.50	.60	.05	3.80	4.85	12
13	"	6.35	.95	.52	.72	Sunday	.63	.45	Sunday	.10	4.05	4.70	13
14	"	7.10	Sunday	.37	.75	.85	.52	.55	.60	.10	Sunday	Sunday	14
15	"	8.00	1.25	.40	.75	.85	.55	Sunday	.85	.10	5.80	4.20	15
16	"	9.20	1.02	.60	.75	.90	.55	.67	.45	.20	6.20	3.80	16
17	3.30	Sunday	.70	.55	Sunday	.85	.60	.50	.40	Sunday	5.70	3.85	17
18	3.20	10.23	.50	.55	1.30	.76	Sunday	.52	.30	.22	5.20	3.45	18
19	Sunday	10.20	.40	.55	1.10	.75	.60	.45	.05	.50	4.35	3.90	19
20	3.40	9.73	.35	Sunday	.80	.75	.60	.50	Sunday	.50	4.40	2.95	20
21	3.10	9.00	Sunday	.50	.48	.70	.60	.50	.35	.50	Sunday	Sunday	21
22	2.45	7.90	.05	.40	.37	.72	.50	Sunday	.50	.20	Holiday	2.30	22
23	2.50	7.30	.12	.50	Sunday	.78	.35	.57	.60	1.00	5.25	2.55	23
24	3.25	Sunday	.02	.45	.05	.75	.50	.45	.40	Sunday	6.55	2.60	24
25	3.25	5.30	.10	.40	.07	.82	Sunday	.05	Holiday	1.93	7.10	3.00	25
26	Sunday	5.35	.15	.47	.35	.78	.55	.45	.40	1.95	7.60	3.10	26
27	3.60	5.70	.20	.50	.52	.78	.45	.20	Sunday	2.10	7.78	3.35	27
28	4.35	5.85	Sunday	.45	.33	Sunday	.43	.07	.50	1.35	Sunday	Sunday	28
29	4.35	6.20	.25	.50	.60	.70	.55	Sunday	.50	.55	.....	3.80	29
30	4.00	Holiday	.10	.60	Sunday	.60	.55	.12	.45	.25	.....	3.60	30
31	.....	.....	.....	.65	.60	.....	.55	.....	.55	Sunday	.....	3.45	31

WATER WORKS

Most of the water pipes laid were 6 inch, 8 inch and 10 inch in diameter, and were laid ahead of improvements to give supply for various sections in need of water.

A 12 inch main was laid in Fifth Avenue from Grandville Avenue to Godfrey Avenue, giving a better supply for the Godfrey Avenue factory district.

The 20 inch main across Grand River at Coldbrook Street was contracted late in 1908, and has been nearly all laid. This will very materially increase the supply on the west side.

A 16 inch main should be laid in Front Street from the point where the river main meets Front Street south to West Bridge Street, as soon as funds are available.

WATER MAINS AND SERVICES LOWERED—MISCELLANEOUS MAINTENANCE

STREET	EXTENT	SIZE	LENGTH	TOTAL	
South Division St.....	Fifth Ave. to P. M. Ry.....	4 inch 6 inch 8 inch Services	917 34 1816 304	3641 79	Lowering
East Bridge St.....	} Ottawa to Barclay.. | Lafayette to Grand.....	4 inch 6 inch Services	71 271 1101	501 61	Lowering

MILES

	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	24 in.	30 in.	36 in.	Hyd- rants	Valves
Prior to 1903.....	40.414	69.809	21.349	8.601	17.447	.239	9.163	.749	2.203	1.937	.565	.019	1656	1739
Laid in 1903.....	.119	1.657	.122	.870	.239	.....	.....	.....	.....	.....	.....	..	30	98
TOTALS.....	40.533	71.466	21.471	9.471	17.686	.239	9.163	.749	2.203	1.937	.565	.019	1656	1837

TOTAL MILES OF PIPE, 173.565.

INVENTORY OF MAINS, 1908

1	2	3	4	5	6	7	8	9	10	11	12	REMARKS
Year	Original Cost	Cost Removed	Remaining Cost	%	Life	S' for \$1.00 Compound'd n. Years	Yearly Dep'n. (4)-(7)	Age	S' for \$1.00 Compound'd n. Years	Total De-precia-tion (8) x (10)	Remaining Value (9)-(11)	
1873	\$ 33,001 07	\$ 1,511 67	\$ 31,489 40	24%	100	\$ 443 37	\$ 71 02	35	\$ 656 32	\$ 5,990 95	\$ 27,498 55	
1874	110,872 69	87,557 00	23,315 69	"	"	"	53 08	34	53 08	3,835 64	80,490 45	
1875	42,520 99	24,598 23	17,922 76	"	"	"	40 23	33	51 61	3,076 27	15,761 49	
1876	26,456 83	"	26,456 83	"	"	"	57 42	32	49 32	3,631 95	23,030 88	
1877	"	"	"	"	"	"	"	31	47 15	"	"	
1878	53 50	"	"	"	"	"	"	30	45 00	"	"	
1879	7,203 23	"	"	"	"	"	12	29	43 90	"	"	
1880	27,594 54	2,306 81	25,287 73	"	"	"	55 03	28	40 85	2,185 47	23,202 55	
1881	519 77	"	519 77	"	"	"	1 17	27	36 60	43 18	476 59	
1882	10,014 87	"	10,014 87	"	"	"	23 58	26	35 01	790 53	9,224 34	
1883	3,623 66	384 65	3,239 01	"	"	"	7 31	24	33 15	243 33	2,995 68	
1884	18,278 77	568 61	17,710 16	"	"	"	39 04	23	29 59	1,233 90	16,080 26	
1885	16,153 84	365 77	15,788 07	"	"	"	35 50	22	31 35	1,051 80	14,716 21	
1886	29,452 76	"	29,452 76	"	"	"	66 43	21	27 86	1,860 74	27,032 02	
1887	122,113 33	4,851 51	117,261 82	"	"	"	294 48	20	26 18	6,924 09	110,337 73	
1888	118,601 63	1,127 00	117,474 63	"	"	"	200 45	19	24 54	6,391 44	108,083 19	
1889	10,616 70	877 33	9,739 37	"	"	"	31 97	18	23 95	504 21	9,235 16	
1890	104,440 58	717 89	103,722 69	"	"	"	223 94	17	21 89	5,625 08	98,718 71	
1891	78,444 50	511 12	77,933 38	"	"	"	175 78	16	19 85	3,490 99	74,442 39	
1892	43,557 54	1,596 09	41,961 45	"	"	"	94 80	15	18 39	1,742 42	40,218 43	
1893	3,087 97	"	3,087 97	"	"	"	6 97	14	16 69	118 00	2,969 97	
1894	19,220 10	212 07	19,008 03	"	"	"	42 67	13	15 00	665 84	18,342 69	
1895	53,633 75	"	53,633 75	"	"	"	130 72	12	14 14	1,708 96	51,916 78	
1896	22,533 95	1,267 14	21,266 81	"	"	"	47 70	11	12 60	610 55	20,656 25	
1897	32,499 39	"	32,499 39	"	"	"	73 30	10	11 48	541 48	31,957 91	
1898	28,326 43	248 16	28,078 26	"	"	"	63 32	9	10 20	645 99	27,432 42	
1899	10,870 04	"	10,870 04	"	"	"	23 16	8	8 00	297 51	10,038 53	
1900	7,042 01	168 30	6,873 71	"	"	"	17 53	7	7 74	135 68	7,038 05	
1901	8,400 07	214 23	8,185 84	"	"	"	18 44	6	6 55	130 91	8,054 93	
1902	43,396 18	"	43,396 18	"	"	"	97 72	5	5 89	526 71	42,769 47	
1903	100,152 66	"	100,152 66	"	"	"	225 69	4	4 26	390 99	99,190 89	
1904	40,859 25	"	40,859 25	"	"	"	92 09	3	3 15	290 08	40,539 17	
1905	33,576 00	"	33,576 00	"	"	"	75 73	2	2 08	137 53	33,418 48	
1906	66,725 29	164 74	66,560 54	"	"	"	150 13	1	1 00	153 13	67,407 41	
1907	23,963 64	"	23,963 64	"	"	"	"	"	"	"	23,963 64	
1908	\$1,294,649 86	\$ 137,648 02	\$1,157,001 84	"	"	"	"	"	"	\$ 60,289 05	\$1,106,712 79	

Check (11) plus (18) equals \$1,106,712.79 equals \$1,157,001.84.

INVENTORY OF MACHINERY, 1908

1 Year	2 COST		4	5 %	6 Life n	7 S' for \$1.00 Compound'd n' Years	8 Yearly Deposit (4)--(7)	9 Age n'	10 S' for \$1.00 Compound'd n' Years	11 Total De- preciation (8) x (10)	12 Remaining Value (4)--(11)	REMARKS
	Original	Removed										
1874	\$ 22,929 34	\$ 3,791 52	\$ 19,137 82	3 1/4	30	853 43		34		\$19,137 82		Of age.
1875	3,943 52		3,943 52	"	"	"		33		3,943 03		Of age.
1877	3,368 66	3,368 66		"	"	"						Of age.
1878	10,505 10		10,505 10	"	"	"	\$ 196 61	30	\$50 62	10,505 19	\$ 57 35	
1879	1,086 45		1,086 45	"	"	"	20 33	29	33 46	1,029 10		
1886	381 00	300 00	81 00	"	"	"	1 52	32	31 33	50 85	30 14	
1887	176 60	130 10	46 50	"	"	"	87	21	29 37	27 26	19 24	
1888	15,240 05	7,941 06	7,298 99	"	"	"	136 60	30	27 28	3,998 28	3,300 71	
1889	15,587 58	13,833 11	1,754 47	"	"	"	32 84	19	25 35	895 88	858 59	
1890	3,613 76	2,069 54	1,544 22	"	"	"	28 90	18	23 50	732 62	811 60	
1891	32,587 12		32,587 12	"	"	"	609 90	17	31 70	14,332 65	18,254 47	
1892	33,175 70		33,175 70	"	"	"	620 92	16	19 97	13,473 96	19,701 74	
1893	2,152 71		2,152 71	"	"	"	40 29	15	18 90	804 59	1,348 12	
1894	4,266 25		4,266 25	"	"	"	79 85	14	16 68	1,461 26	2,804 99	
1895	39,561 09		39,561 09	"	"	"	740 43	13	15 11	12,350 37	27,210 72	
1896	4,707 50		4,707 50	"	"	"	88 11	12	13 60	1,331 34	3,376 16	
1897	907 81		907 81	"	"	"	16 99	11	9 37	231 06	676 75	
1900	263 60		263 60	"	"	"	4 92	8	8 06	46 10	217 50	
1901	1,500 00		1,500 00	"	"	"	28 08	7	6 78	226 04	1,273 96	
1902	3,500 00		3,500 00	"	"	"	65 51	6	5 55	444 16	3,055 84	
1903	1,257 61		1,257 61	"	"	"	23 53	5	5 55	130 59	1,127 03	
1903	3,616 00		3,616 00	"	"	"	67 67	5	4 36	375 57	3,240 43	
1904	143 25	Shop	143 25	"	"	"	2 68	4	3 23	11 68	131 57	
1904	2,649 31	Station	2,649 31	"	"	"	49 58	3	1 03	159 65	2,489 66	
1905	2,741 04		2,741 04	"	"	"	51 30	1		52 84	2,688 20	
1907	638 38		638 33	"	"	"		0			638 33	
1908												
	\$210,499 38	\$31,433 99	\$179,065 39							\$85,752 30	\$93,313 09	

Check (11) plus (12) equals (4) \$ 85,752 30
93,313 09
\$179,065 39



VIEW OF FLOOD WALL
North of Sixth Street Bridge.

INVENTORY OF STANDPIPE, 1908

1 Year	COST					6 %	7 Life in Years	8 S. for \$1 Com- pounded n Years	9 Yearly Deposit (5) - (8)	10 Age in Years	11 S' for \$1 Com- pounded n Years	12 Total Depreci- ation (9) x (11)	13 Remaining Value (5) - (12)	14 REMARKS
	ORIGINAL COST		Removed	Remaining										
	Land	Structural												
1898	\$ 576 00	.....	.....	\$ 576 00	8%	20	\$ 62.43	\$519 63	.....	20	\$ 29 27	\$548 13	\$ 576 00	.....
1899	.....	\$ 11,745 40	.....	11,745 40	8%	20	.....	.....	.....	20	.....	.....	5,211 27	.....
1900	503 67	.....	.....	503 67	3%	50	135 56	2 01	.....	3	3 22	6 47	503 67	.....
1901	.....	272 36	.....	272 35	.....	.....	.....	.....	.....	.....	.....	.....	265 98	.....
1902	230 00	.....	.....	230 00	3%	60	126 55	140 11	.....	2	2 11	265 63	350 00	.....
1903	.....	13,995 07	.....	13,995 07	3%	50	135 56	92 26	.....	1	1 05	92 16	12,700 44	.....
1907	.....	12,638 31	.....	12,638 31	.....	.....	.....	.....	.....	.....	.....	.....	12,652 15	.....
.....	\$ 1,329 67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	\$6,832 29	\$ 23,169 41	.....
Check (20) plus (5) equals (6) \$ 1,329 67														
..... 42,675 13														
..... \$45,001 80														

INVENTORY OF RESERVOIRS, 1908

1	2	3			4	5	6	7	8	9	10	11	12	13	14
		COST													
		ORIGINAL COST		REMOVED											
Land	Structural														
1874	\$25,050 00				\$25,050 00	2	50	\$118 18	\$604 86	34	\$58 46	\$20,016 56		\$25,050 00	
1875		\$59,654 71			\$59,654 71	"	"							\$25,050 73	
1876		\$4,504 50			\$4,504 50	"	"								
1877		4,093 66			4,093 66	"	"								
1878		124 94			124 94	"	"								
1901		45 00			45 00	"	50	118 18	39	7	7 82	3 08		41 92	
1908		380 85			380 85	"	50	118 18	7 68	6	5 47	41 45		839 36	
	\$25,050 00	\$68,350 66		\$28,700 10	\$64,680 56							\$20,032 52		\$54,657 04	

Check (12) plus (13) equals (5)

\$20,032 52

\$54,657 04

\$74,689 56

INVENTORY OF PUMPING STATION AND GROUNDS, 1908

Year	3		4		5	6	7	8	9	10	11	12	13
	ORIGINAL COST		COST										
	Land	Structural	Removed	Remaining									
1874	\$ 5,000 00	\$ 22,462 70	\$ 351 35	\$ 5,000 00	\$			\$ 116 16	\$ 191 35	34	\$ 59 46	\$ 11,877 77	\$ 5,000 00
1875		1,899 11	30 00	21,814 05		50			16 65	35	53 73	587 33	10,868 54
1876		1,164 58		1,164 58					10 03	32	54 08	549 42	191 59
1877		70 95		70 95					61	31	61 80	31 42	682 16
1878		82 50		82 50					71	30	49 00	34 79	39 53
1879		497 44		497 44					4 25	29	49 87	199 33	47 71
1880		39 79		39 79					34	28	44 22	15 02	293 12
1881		21 12		21 12					1 17	27	41 93	7 55	44 72
1882		136 25		136 25					25 03	26	37 65	693 55	13 57
1883		2,907 68		2,907 68					4 44	25	35 87	114 86	97 14
1884		516 89		516 89					45 35	24	23 41	1,080 78	3,215 07
1885		93 05		93 05					163 76	23	30 76	2,963 49	89 11
1886		5,352 24		5,352 24					98 43	22	17 16	1,770 96	4,271 45
1887		16,585 19		16,585 19					103 76	21	15 09	189 28	12,622 49
1888		10,728 52		10,728 52					98 43	20	17 60	72 94	6,957 56
1889		459 75		459 75					4 22	19	17 60	72 94	415 42
1890		553 09		553 09					4 90	18	15 09	189 28	460 15
1891		1,172 76		1,172 76					10 10	17	15 19	189 28	1,040 64
1892		116 46		116 46					3 07	16	9 43	25 12	18 00
1893		357 05		357 05					1 14	15	2 09	1 71	385 05
1894		183 30		183 30					1 14	14	2 09	1 71	168 05
1895		186 84		186 84					1 14	13	2 09	1 71	154 19
1896		23 45		23 45					1 14	12	2 09	1 71	22 45
1908	\$ 5,000 00	\$ 65,338 55	\$ 351 35	\$70,065 16								\$ 30,088 08	\$ 50,016 54

Check (12) plus (13) equals (5).....\$70,065 16
 50,016 54
 \$70,065 16

INVENTORY OF INTAKES, 1908

1	2	COST			6	7	8	9	10	11	12	13	14
		ORIGINAL COST											
		Land	Structural	Removed									
1897													
1898		\$ 4,384.96		\$ 4,384.96	24	\$63.43	639.27	19	967.85	\$1,074.01	\$1,039.70		
1899		2,714.92		2,714.92	"	"		30	35.25	753.54	1,945.68		
1900		13,835.50		11,751.06	"	"		30	35.25	845.87	1,089.05		
1901		1,609.28			"	"		30	35.25	845.87	1,089.05		
1902		2,082.50			"	"		32	36.64	19.97	547.05		
1903		1,738.87			"	"		30	36.64	18.11	314.89		
1904		1,832.70			"	"		30	30.60	15.16	756.96		
1905		1,111.25			"	"		30	19.18	230.71	730.67		
1906		1,971.35			"	"		30	15.16				
		\$20,380.73	\$13,981.05	\$10,449.64						\$113.54	\$9,336.10		

Check (12) plus (13) equals (5) .. \$ 4,164.54
 9,336.10
\$10,449.64

CONDUITS

About \$13,000.00 was spent during the past year for constructing conduits, purchasing and placing cables.

The greater portion of the conduits were placed in East Bridge Street from Ottawa Street to Barclay Street, and in South Division Street from Fifth Avenue to Stevens Street. Ducts were purchased for the latter street to extend the conduits to the Pere Marquette Railroad, but were not laid on account of delay in the improvement.

The following table gives the receipts and expenditures of the Conduit Fund for the year with number and kind of ducts laid. \$8,000.00 of the disbursement was transferred temporarily to help other funds.

Detail statement of expenditures follows:

STATEMENT OF CONDUIT FUND

FOR FISCAL YEAR ENDING MARCH 31, 1909

	Receipts	Disbursements	Number of Ducts
Balance in fund March 31, 1908.....	\$ 590 89	.....	.....
Loan from Contingent Fund May 28, 1908.....	5,000 00	.....	.....
Budget allowance Aug. 22, 1908.....	15,000 00	.....	.....
Return of loan to Contingent Fund Sept. 26, 1908.....	.....	\$ 5,000 00	.....
Temporary transfer to General Fund Feb. 19, 1909.....	.....	8,000 00	.....
E. Bridge Street	54 63	.....	.....
		.....	4 multiple duct
		.....	6 multiple duct
		2,550 94	4 multiple duct
		.....	4 fibre duct
S. Division Street	.....	.....	4 multiple duct
		.....	4 multiple duct
		3,734 06	6 multiple tile
E. Fulton Street.....	6 43	6 74	.....
Lighting Plant Cables.....	.....	1,818 66	.....
General.....	21 07	88 39	.....
Stock.....	26 50	148 31	.....
N. Division St., engineering, plans.....	6 00	.....	.....
	\$20,635 50	\$ 21,347 10	
		20,635 50	
Overdraft March 31, 1909.....		\$ 651 60	

ITEMIZED DISBURSEMENT

E. BRIDGE STREET CONDUIT

Labor	\$ 956 89
Pipe, couplings, etc	158 81
Cement	255 46
Conduits	769 29
Conduit manholes	31 37
Gravel, sand and dirt	288 25
Rails and plates	36 42
Screen	84
Sewer brick	28 05
Hauling away dirt	5 00
Lanterns	6 10
Cheese cloth	10 00
Engineering	18 00
Car fare	1 40
Tools	2 29
Cartage	23 45
Setting conduit cover.	76
Repair shop	67
Street repair	13 39
	<u>\$ 2,550 94</u>

CREDIT

Edison Co. labor and material	\$ 87 36
Engineering	4 00
Pipe and couplings	8 12
Cement	5 14
	<u>54 62</u>
	\$ 2,496 82

E. FULTON STREET CONDUITS

Pipe and couplings	\$ 2 81
Cement	2 03
Cartage	2 40
	<u>6 74</u>

LIGHTING PLANT CABLES

Cable	\$ 1,775 28
Lead pipe and wiping cloths.....	6 00
Cartage.....	4 50
Freight on cable.....	82 28
	<hr/>
	\$ 1,818 66

S. DIVISION STREET CONDUIT

Labor.....	\$ 1,427 79
Conduits	707 72
Freight	157 74
Lumber	3 32
Tools	7 00
Gravel, sand and dirt.....	328 28
Sewer brick.....	138 73
Lanterns	2 43
Rails and iron.....	122 08
Cement.....	522 27
Cheese cloth.....	14 17
Pipe, coupling, etc.....	68 87
Pails	1 08
Sewer pipe.....	21 70
Conduit cover.....	11 50
Paving brick.....	2 56
Conduit manholes....	108 50
Sewer manholes.....	45 00
Engineering.....	10 00
Car fare.....	55
Cartage.....	16 89
Concreting trench.....	11 00
Hauling away dirt.....	9 90

\$ 3,734 08

Credit Iron plates.....	\$ 92
Cement	5 50

6 42

6 42

\$ 3,737 64

GENERAL

Louis and Commerce Sts. rpr. lab.....	\$ 11 60
Louis and Commerce Sts. rpr. cement.....	2 40
Engineering.....	1 00
Hauling conduits from car.....	78 39
	<u>\$ 88 39</u>
Credit—Uncalled for labor checks.....	21 07
	<u>\$ 67 32</u>

STOCK

Conduits	\$ 148 31
Credit, Conduits.....	\$ 20 16
Rails	6 34
	<u>\$ 26 50</u>
N. Division St. Conduits, Credit Engineering plans.....	\$ 6 00

BRIDGE WORK

The completion of Ann Street Bridge was the only construction work under way during the year. This consisted of the two field coats of painting and laying of the concrete sidewalks. The following tables give the receipts and disbursements, the itemized disbursements and the total cost of bridge:

REPORT OF ANN STREET BRIDGE FUND

For fiscal year ending March 31st, 1909

	Receipts	Disbursement
Overdraft March 31, 1908.....		\$ 8,048 13
Appropriation July 29th, 1908.....	\$18,500 00	
Temporary loan from General Fund, Feb. 19, 1909...	691 54	
Ann Street Bridge—Superstructure.....		3,775 38
Flooring.....		287 79
Painting steel work and laying concrete sidewalk.....		1,984 22
Approaches.....	2 79	68 88
Piers and abutments.....		30 00
	<u>\$14,194 83</u>	<u>\$14,194 88</u>

ITEMIZED DISBURSEMENT

SUPERSTRUCTURE

Payments on contract.....	\$ 3,299 47
Extras	26 70
Engineering.....	32 00
Car fare.....	1 80
Steel inspection.....	405 49
Changing angles on diagonals.....	9 90
Total	\$ 3,775 36

FLOORING

Creosoted planks and blocks, payment on contract.....	\$ 170 16
Pitch (10 bbls.).....	40 40
Engineering.....	6 00
Car fare.....	15
Inspection.....	20 25
Cartage.....	12 30
Labor, headers.....	33 56
Labor, barricading sidewalks.....	2 38
Guard rails.....	1 00
Sand on bridge.....	1 59
Total.....	\$ 287 79

PAINTING STEEL WORK AND LAYING CON-
CRETE SIDEWALK

Payments on contract.....	\$ 1,510 17
Engineering	24 00
Car fare.....	1 85
Advertising	7 66
Inspection	174 19
Paint	200 40
Cartage	4 45
Machine bolts.....	75
Telephone messages.....	75
	\$ 1,984 22

PIERS AND ABUTMENTS

Labor and material.....	\$ 30 00
-------------------------	----------

APPROACHES

Labor	\$ 10 55
Cobble stone.....	2 50
Gravel.....	1 77
Labor-rip-rapping	15 94
Labor, fence and filling.....	15 83
Cedar posts and lumber.....	8 12
Hack saw.....	40
Engineering	6 00
Car fare.....	75
Cleaning up	9 18
	<hr/>
	\$ 66 04

TOTAL COST TO DATE

ITEM	Previous to Apr. 1908	Apr. 1, 1908 to Mar. 31, 1909	TOTAL
Piers and abutments.....	\$ 18,748 34	\$ 30 00	\$ 18,778 34
Superstructure—Steel.....	83,805 35	3,775 36	87,580 71
Superstructure—Roadway	6,108 10	287 79	6,395 89
Superstructure—Painting and Sidewalks.....		1,984 22	1,984 22
Approach—east.....	4,171 97	33 02	4,204 99
Approach—west	12,104 47	33 02	12,137 49
Total.....	\$ 74,988 23	\$ 6,143 41	\$ 81,081 64

BRIDGE MAINTENANCE

The wooden sidewalks on Pearl Street Bridge, including the greater portion of the stringers, were renewed, the steel work exposed being thoroughly cleaned and painted. The remainder of the work consisted of minor repairs to the various bridges.

The detail cost of the work follows:

REPORT OF BRIDGE FUND
FOR FISCAL YEAR ENDING MARCH 31, 1909

	Receipts	Disburse- ment
Balance in fund March 31, 1909.....	\$ 411 57	
Budget allowance August 22, 1908.....	2,200 00	
Pearl St.....	117 93	\$ 1,744 31
Leonard St.....		62 41
Fulton St.....		56 59
Sixth St.....		14 34
Ann St.....	65 40	18 76
Wealthy Ave.....		4 50
Wealthy Ave. swinging.....		9 20
Bridge St. from G. R. Ry. Co.....	1,200 00	1 13
Old Bridge St. Bridge, steel.....		90 00
John Ros, cleaning bridge to June 22, 1908.....		157 20
Sundry	2 85	28 46
Stock	180 00	506 88
	\$ 4,127 75	\$ 2,693 78
	2,693 78	
Balance in fund March 31, 1909.....	\$ 1,433 97	

ITEMIZED DISBURSEMENTS

PEARL STREET

Replanking—Labor.....	\$ 468 70
Lumber	1,040 65
Nails.....	21 92
Gravel.....	25
Threaded nuts.....	2 28
Engineering.....	11 00
Car fare.....	15
Cartage.....	2 65

PEARL STREET—CONTINUED

Replanking—Advertising.....	\$ 16 17
1 bbl. graphite.....	65 40
Painting, material.....	5 88
Cast iron brackets.....	2 05
Truss—Labor	60 45
Material	46 26
Cartage.....	50
	<hr/>
	1,744 31
CREDIT—Truss work paid by G. R. Ry. Co.....	117 98
	<hr/>
	\$1,626 38

LEONARD STREET

Engineering	\$ 2 00
Car fare	10
Labor.....	39 34
Lumber	2 34
Nails.....	44
Soft steel bars.....	6 16
Nuts and washers.....	9 56
Repair shop.....	67
Cartage.....	1 80
	<hr/>
	\$ 62 41

FULTON STREET

Labor.....	\$ 8 24
Lumber	6 01
Nails.....	17 05
Coal	7 10
Railing Lumber.....	2 69
Washers and handhole crab.....	50
Padlock.....	50
Saw repair	1 50
Cartage	18 00
	<hr/>
	\$ 56 59

SIXTH STREET

Labor.....	\$ 1 77
Galvanized wire.....	2 85
Repair tar walk.....	5 82
Cartage	80
Tools.....	3 60
	<hr/>
	\$ 14 34

ANN STREET

Approach rails—Labor.....	\$ 10 88
“ “ —Lumber.....	7 68
“ “ —Nails	20
	<hr/>
	\$ 18 76
CREDIT—1 bbl. graphite.....	\$65 40

WEALTHY AVENUE

1 iron snatch block.....	\$ 4 50
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WEALTHY AVENUE—SWINGING

Engineering	\$ 1 00
Car fare.....	50
Labor	7 70
	<hr/>
	\$ 9 20

BRIDGE STREET

Labor picking up seats.....	\$ 1 18
-----------------------------	---------

CREDIT—G. R. St. Ry. Co. payment for paving....\$1,200 00

OLD BRIDGE STREET BRIDGE—STEEL

Rent of land for storage	\$ 90 00
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SUNDRY

Engineering.....	\$ 4 00
Car fare.....	05
Broadway Street—Painting rails, labor.....	16 95
Turner Street—Painting rails, engineering.....	3 00
“ “ —Car fare.....	30
“ “ —Labor	3 51
Pail and broom.....	05
	<hr/>
	\$ 28 46

CREDIT—Uncalled for labor checks.....\$2 85

STOCK—Lumber.....	\$ 405 72
“ Unloading, labor.....	18 98
“ Cartage.....	1 25
Nails	35
Red paint.....	80 00
	<hr/>
	\$ 506 88

CREDIT—Lumber.....\$180 00

INVENTORY OF BRIDGES 1908-1909

1	2	3	4	5	6	7	8	9	10	11	12
Location	Portion	Year Bldg	Original Cost	%	Life	S for B. Com. p'd n Years	Yearly Deposits (4) x (7)	Age n	S for B. Com. p'd n Years	Total Depreciation (8) x (10)	Remain-ing Value
Leonard Street.	Rear Abutment and Girders.	1879	\$13,190.00	3 1/4	25	\$ 60.00	\$191.15	30	\$ 60.00	\$ 5,795.01	\$ 7,395.00
Fulton Street.	Masonry	1883	19,911.00	3	40	77.00	250.58	25	77.00	9,689.25	10,221.75
Fulton Street.	Superstructure	1883	20,948.00	3	40	77.00	260.73	25	77.00	10,131.05	10,816.95
Pearl Street over river.	Superstructure	1885	11,894.00	3	40	77.00	153.15	23	33.43	5,119.89	6,774.11
Pearl Street over river.	Superstructure	1885	30,480.00	3	40	77.00	363.71	23	33.43	8,815.53	11,664.47
Pearl Street over W. Canal.	Superstructure	1886	4,315.00	3	40	77.00	54.87	23	31.45	1,705.72	2,609.28
Pearl Street over W. Canal.	Superstructure	1886	3,798.00	3	40	77.00	46.50	23	31.45	1,537.91	2,260.09
Sixth Street.	Superstructure	1890	7,963.00	3	40	77.00	102.53	23	31.45	3,324.57	4,638.43
Sixth Street.	Superstructure	1890	20,281.00	3	40	77.00	261.18	23	31.45	8,313.17	11,967.83
Bridges Street over W. Canal.	Superstructure	1883	1,000.00	3	40	77.00	11.87	25	37.56	483.49	556.51
Bridges Street over W. Canal.	New Abutments.	1901	2,730.00	3	50	116.18	23.49	7	7.89	186.34	2,543.66
Bridges Street over W. Canal.	Cylinder Piers.	1901	500.00	3	50	116.18	4.30	7	7.89	33.02	466.98
Bridges Street over W. Canal.	Old Girders.	1887	7,000.00	3	40	77.00	90.13	31	25.54	2,032.44	4,967.56
Bridges Street over W. Canal.	New Girders	1901	1,900.00	3	40	77.00	20.80	7	7.89	103.59	1,796.41
Bridges Street over E. Canal.	Roadway	1901	1,000.00	3 1/4	30	36.36	54.66	7	8.05	440.17	1,159.83
Bridges Street over E. Canal.	Superstructure and over River	1901	31,000.00	2 1/4	80	364.60	63.43	7	7.73	337.57	30,662.43
Wealthy Avenue main.	Superstructure	1904	100,200.00	2 1/4	80	234.00	503.95	5	5.39	2,123.39	98,076.61
Wealthy Avenue main.	Superstructure	1904	35,297.00	2 1/4	80	254.00	199.26	4	4.36	433.23	34,863.77
Wealthy Avenue main.	Superstructure	1905	38,098.00	3	40	77.00	467.14	3	3.18	1,380.91	36,717.09
Bridge Street	Arch.	1905	16,973.00	2 1/4	30	254.00	66.66	3	3.15	309.99	16,663.01
Ann Street	in Stock	1883	3,750.00	3	40	77.00	45.90	35	87.56	1,813.77	1,966.23
Ann Street	Superstructure	1907	18,776.34	2 1/4	80	263.80	73.78	1	1.03	534.75	18,241.59
Ann Street	Superstructure	1907	39,564.92	3	40	77.00	509.47	1	1.03	534.75	38,930.17
Ann Street	Roadway	1907	6,395.89	3 1/4	30	36.36	218.50	1	1.03	255.14	6,140.75
Ann Street Approach.	East.	1907	4,204.49	...	...	...	...	...	...	None	4,204.49
Ann Street Approach.	West.	1907	12,137.49	...	...	...	...	...	...	None	12,137.49
Turner Street over.	Indian Mill.	1906	6,394.85	3	50	116.18	55.04	9	3.09	115.09	6,279.76
Alpine Avenue	Indian Mill.	1907	1,717.98	3	40	77.00	23.13	1	1.03	23.78	1,694.20
Alpine Avenue	Steel from stock.	1907	625.00	3	40	77.00	8.08	1	1.03	8.39	616.61
Broadway Street.	Indian Mill.	1907	2,307.79	3	50	116.18	37.81	1	1.03	23.43	2,284.36
Broadway Street.	Steel, Stock	1907	695.00	3	40	77.00	8.05	1	1.03	8.39	616.61

Check equals (11) plus (12) equals (4), \$ 60,819.83
 306,500.80
 \$436,685.96

HOSPITAL WORK

The Scarlet Fever Hospital building was built by Oldenkamp Bros.; the heating and ventilating was intalled by Sproul & McGurrin; the plumbing by Wm. Manns; the wiring and fixtures by day labor on account of high bids. The estimated cost was \$450.00; the lowest bid was \$542.00; the work cost, as shown below, \$428.00, with the quality of the fixtures somewhat increased.

The appropriation was somewhat below the estimate, but the building will be completed within \$100.00 of the estimate with some extra piping, etc., included.

The detail cost of the work follows:

REPORT OF SCARLET FEVER HOSPITAL

FOR FISCAL YEAR ENDING MARCH 31, 1909

HEATING AND VENTILATING—

Payments on contract	\$1,886 57	
Engineering	2 00	
Car fare	15	
		\$ 1,888 72

PLUMBING—

Payments on contract	896 92
----------------------------	--------

WIRING AND FIXTURES—

Labor	111 35	
Material	149 25	
Advertising	22 96	
Telephone	70	
Engineering	4 00	
Cartage	1 25	
Engineering (extra)	17 00	
Car fare (extra)	40	
Bit (extra)	85	
		307 76

BUILDING—

Payments on contract	\$ 5,842 00
Inspection	119 00
Engineering	129 00
Advertising	46 00



DIPHTHERIA HOSPITAL

BUILDING—Continued.

Architect's plans.....	\$ 221 06
Car fare.....	3 85
Sewer—Engineering.....	6 00
Sewer—Car fare.....	70
Electrical supplies (extra)	80
Air pipe system—Labor	12 36
Air pipe system—Material.....	10 40
	<hr/>
	\$ 6,391 15
Total	<hr/>
	\$ 9,484 57

EXPENSES YET TO BE PAID—

Balance due on building contract.....	\$ 474 00
Pay roll—Wiring during March and April.....	26 30
Ackerman—Wiring supplies during March and April.....	2 83
Litscher Electric Co.—Fixtures.....	81 14
Supervision	10 00
	<hr/>
	\$ 594 27
Grand total.....	10,078 84
Appropriation	10,000 00
	<hr/>
Overdraft.....	\$ 78 84

NOTE—\$22.76 of this covering air piping was extra and should not have been paid from this fund.

TUBERCULOSIS PAVILIONS

\$5,950.00 was appropriated for the four buildings. After the contract was awarded it was found that \$850 00 borrowed the preceding year must be deducted. This left an overdraft. The detail cost of the work follows:

REPORT OF TUBERCULOSIS PAVILIONS

FOR FISCAL YEAR ENDING MARCH 31, 1909

Payments on contract.....	\$ 5,165 87
Inspection.....	181 25
Advertising	27 37
Engineering.....	125 00
Car fare.....	1 90
Lowering sewer—Labor.....	8 96
“ “ —Engineering.....	21 00
“ “ —Car fare.....	2 05

Four sets of hangers.....	\$	8 00	
Nails, screws and hinges (extra).....		16 21	
Cartage.....		2 00	
			\$ 5,509 61
Appropriation.....	\$	5,950 00	
Loan.....		850 00	
Remaining.....	\$5,100 00		\$5,100 00
Overdraft.....			\$ 409 61

SMALLPOX HOSPITAL

The old building was moved by the Board of Health and overhauled and added to by this Department by day labor, the intent being to do only such work as the funds would permit. The cost of the work follows:

REPORT OF SMALLPOX HOSPITAL
FOR FISCAL YEAR ENDING MARCH 31, 1909

Labor—Sewer and water.....	\$	109 74	
" Carpenter.....		224 64	
" Plumbing.....		52 80	
" Painting.....		7 27	
" Plastering and chimney.....		112 35	
Inspection.....		21 00	
Engineering.....		55 00	
Car fare.....		80	
Advertising.....		15 30	
Repair Shop.....		1 58	
Extra—Engineering.....		2 00	
" Car fare.....		15	
Lumber.....		208 00	
Lath.....		12 50	
Nails.....		9 91	
Building paper.....		2 50	
Roofing.....		22 40	
Locks, etc.....		3 32	
Sewer and Water material.....		85 96	
Paint.....		5 15	
Boiled oil.....		1 08	
Plaster board.....		18 00	
Thimbles, screws and bolts.....		79	
Cartage.....		7 08	
			\$ 979 32
Appropriation.....			955 00
Overdraft.....			\$ 24 32

The appropriation was \$1,125.00 of which the Board of Health used \$170.00 moving the old building and barn.

Other miscellaneous work was done around the administration building, water supply and sewerage disposal plant, the cost of which is shown below:

REPORT OF CONTAGIOUS DISEASE HOSPITAL FUND

FOR FISCAL YEAR ENDING MARCH 31, 1909

	Receipts	Disbursement
Overdraft March 31, 1908.....		\$ 358 11
Budget Allowance August 22, 1908.....	\$ 1,090 00	
Temporary loan from Scarlet Fever Hospital Fund, February 19, 1909.....	600 00	
Contagious Disease Hospital—Pump and Motor.....		34 06
“ “ “ Septic tank & filter bed.....		36 55
“ “ “ Sundry		50 87
Hospital Grounds, land.....		1,185 00
	<u>\$ 1,690 00</u>	<u>\$1,614 59</u>
	1,614 59	
Balance in fund March 31, 1909.....	\$ 75 41	

ITEMIZED DISBURSEMENT

Pumps and Motor—Connecting 10 H. P. motor on pump.....	\$ 34 06
Septic Tank and Filter Bed, Septic Tank—Engineering.....	\$ 18 00
“ “ Car fare	90
“ “ Labor	11 65
“ “ Gravel	6 00
	<u>\$ 86 55</u>
Sundry, Lowering Sewer—Labor.....	\$ 34 19
“ “ —Material.....	4 80
“ “ —Cartage.....	5 15
Conduits, Poultry netting.....	4 48
Driveway, Cinders	2 25
	<u>\$ 50 87</u>

OPENING OF STREETS

There were issued during the year permits to the number of 1694, divided as follows:

Sewer connections.....	245
Water connections.....	411
Sewer and water connections.....	707
Miscellaneous connections.....	215
Conduit connections.....	107
Cancelled.....	19
Total.....	1694

STREET OPENING FUND

FISCAL YEAR ENDING MARCH 31, 1909

	Receipts	Disbursement	Balance of Accounts Receivable
Overdraft March 31, 1908.....		\$ 547 28	
Inspection—Work.....	\$ 641 84	222 28	\$ 1 17
" Street.....	641 83	222 28	
" Corporation.....	533 70	520 28	
Asphalt repair.....	358 80		10 35
Rolling.....	972 10	1,121 28	
Repair—Labor.....	1,770 43	1,004 03	21 36
" Material.....	167 07	912 28	34 83
Transfers—Labor.....	165 08	121 08	
Incidentals, etc.....	418 58	150 97	47 72
Sprinkler.....	27 15		5 00
Loan.....	1,000 00		
	\$7,496 36	\$6,372 93	\$ 1,123 43
	6,372 93		
Balance March 31, 1909.....	\$1,123 43		

STREET SIGNS

1593 blue enameled street signs with white letters were ordered during the year. About two-thirds have been placed. Where consent of owner can be secured the signs are placed on buildings, otherwise on the old cast iron lamp posts, which are reset where needed. The American Sign Company's brackets has been used for supporting the signs on the posts.

The cost of the work follows:

REPORT OF STREET SIGN FUND FOR FISCAL YEAR ENDING MARCH 31, 1909

Balance on hand March 31, 1908.....	\$	73 04	
Budget allowance August 22, 1908.....		1,000 00	
Receipts.....		29 28	
Disbursement.....	\$	891 71	
	\$	1,102 32	891 71
		891 71	
Balance in fund March 31, 1909 .	\$	210 61	

DETAILED DISBURSEMENT

Labor.....	\$	383 86	
Engineering		47 00	
Car fare		1 25	
Inspection.....		10 50	
Signs.....		409 95	
Freight on signs		8 25	
Cartage		5 85	
Punch and drills		1 58	
Ratchet		6 75	
Washers and screws		3 49	
Ladders, bolts, etc		7 13	
Sharpening tools.....		90	
Weighing scrap iron.....		20	
	\$	891 71	
Credit—Sale of scrap iron.....		29 28	
	\$	862 43	

MARSHAL'S DEPARTMENT

The new charter provided for the placing of the Marshal's Department under the Board of Public Works, May 1, 1908. The direct supervision of the work was placed by the Board under the Engineering Department. At about the same time a Pole Inspection Department was established by ordinance and placed under the Engineering Department.

The two clerks previously employed in the Marshal's office were dropped and their work distributed among the regular employees in the Engineering Department. The Marshal and his Deputy were able to handle the pole inspection work in addition to their regular work.

The following statement shows the comparative saving resulting from the consolidation. A detail statement of work done and cost of same follows:

STATEMENT OF EXPENDITURES FROM GENERAL FUND FOR SIDEWALKS AND POLE INSPECTION, HOUSE NUMBERS AND NUISANCES

SIDEWALK EXPENDITURES, 1908-9

Salaries—Inspection	\$ 588 18	
Descriptions	329 59	
Serving notices	397 60	
Returns	58 00	
Contracting, etc	82 00	
Expenses—Approaches	1,182 78	
Aprons, etc	1,421 73	
		<hr/>
		\$ 3,949 88
New concrete walks built and billed to property owners		2,801 81
		<hr/>
		\$ 6,751 69

ELECTION EXPENSES

Election boards.....	\$	99 00	
Labor cartage and lumber.....		281 97	
			330 97

HOUSE NUMBERING

Salaries and numbers.....	223 00
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POLE INSPECTION

Salaries.....	645 00
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DRINKING FOUNTAIN

Ice and repairs.....	38 98
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NUISANCES, etc.

Encroachments	\$	55 00	
Trimming trees.....		10 00	
House moving.....		18 00	
Barb wire removed.....		10 00	
Obstructions		20 00	
			118 00

GENERAL EXPENSES

Horse care.....	\$	165 00	
Printing		34 50	
Tools, etc.....		15 37	214 87
Total expenditure.....	\$	8 817 46	
Deductions —Private walks	2,801 81		
Pole inspection	645 00	8,416 81	
Net cost	\$	4,870 65	

NOTE—Of this amount \$814.19 was spent before the Department was placed under the supervision of the Board of Public Works.

Salaries to the amount of \$286.69 outside of Marshal and Deputy salaries are included in above.

NOT DETAILED EXPENDITURES 1907-8

Salaries	\$ 3 771 00
Labor.....	1,505 16
Office supplies.....	22 10
Books, etc.....	10 50
Postage	9 00
General supplies.....	85 20
Water for office.....	6 70
Horse care.....	165 00
New walks built and billed to owners.....	1,893 40
Approaches.....	1,104 60
Lumber.....	641 58
Repairs.....	3 65
Car tickets.....	110 00
Drinking fountains	57 84
Hauling	3 00
Miscellaneous	111 00
Total expenditure.....	\$ 9,499 73
Reductions—Private walks.....	1,893 40
Net cost.....	\$ 7,606 33

GENERAL WORK

The work of various kinds under the control of the Department, the expense of which is paid from the General Fund, is gradually increasing. The addition of the Marshal's Department and Police Inspection Department has so increased the work for the Clerical and Permit Departments, that the work of indexing and filing is behind. The installation of new steel files made by the General Fireproofing Co. of Youngstown, made possible and necessary the revising of our index of plans. This has been taken advantage of and a decimal system adopted much more flexible for future growth. The greater portion of the plans have been reindexed and rearranged.

Considerable attention has been given to correcting erroneous house numbers. This had been put off for several years, hoping the Council would adopt the Block System, which is much needed and would be of great convenience and general value.

The following tables show the detail office and field expenses of the Department for the year:

SALARIES

CHARGEABLE TO GENERAL FUND—

Office work.	\$ 11,67 51
Building line surveys.....	91 13
" " " section.....	68 44
" " " street.....	333 08
Topography.....	37 52
Encroachments	73 00
Grade line levels (new)	178 26
Checking plats	239 50
Monuments.	263 15
Sidewalks.....	456 00
Hall street opening.....	33 00
Hilton street opening.....	1 00
Guarantee measurements.....	27 00
Eleventh street opening.....	3 00
Arianna street opening.....	1 00
Lecture.....	14 00
Testing.....	220 00

CHARGED TO VARIOUS FUND —

\$ 13,106 59

Streets and Sewers.....	\$ 4,182 00
Water works.	732 00
Bridges	116 00
Flood fund.....	4,989 00
Flood relief No. 2 fund	123 00
Poor fund.....	161 00
Scarlet fever hospital fund.....	153 00
Board of Education.	63 00
Conduit Fund.....	29 00
Road Roller Fund.	33 00
Fire Department Fund.	10 00
Police Fund.....	4 00
Street Repair Fund.....	83 00
Street Opening Fund.	1 00
Health Fund	59 00
First Sewer District Fund.....	4 00
Second " " "	55 00
Third " " "	

449074

First Ward Highway Fund.....	\$ 12 00
Second " " "	2 00
Third " " "	3 00
Sixth " " "	4 00
Eleventh " " "	9 00
Twelfth " " "	16 00
Holland Interurban	6 00
West Michigan State Fair Association	11 00
G. R. Street Railway Company	43 00
Pere Marquette Railway Company	1 00
Contagious Disease Hospital Fund	48 00
Park Commissioners	16 00
G. R.—Muskegon Power Company	1 00
Street signs	47 00
	<hr/>
	\$11,022 00

GENERAL FUND SPECIAL—

Grade Separation.....	\$ 476 00
Grand Trunk Foot Bridge.. ..	34 00
Waste Paper Cans.....	5 00
County Farm Water Tower.....	121 00
Store-room on Island.....	12 00
Trusses for Market Street Theater.....	2 00
"B" Street Steps.....	5 00
Coasting.....	14 00
	<hr/>
	\$ 689 00
	<hr/>
Grand Total.....	\$ 21,797 50

SUPPLIES

OFFICE—

Postage and express	\$ 148 13
Library	39 41
Printing	289 83
Phone and telegrams	44 03
Stationery.....	37 90
Typewriter	14 40
Files, ink, pens, pencils, lecture, etc.....	380 26
	<hr/>
	\$ 1,079 98

DRAFTING AND BLUE PRINTING—

Blue print paper.....	\$ 113 36
Tracing paper.....	58 50
Map paper.....	27 34
Profile paper.....	1 80
Ink and miscellaneous.....	37 34
	<hr/>
	\$ 228 34

FIELD—

Livery	\$ 294 00
Supplies	27 95
Testing materials and power.....	151 69
Car fare.....	800 80
Sharpening Stakes.....	33
Tape repair.....	1 55
Candles.....	10
	<hr/>
	\$ 1,276 42

Steel office files.....	1,112 50
	<hr/>
	\$ 3,697 24

ENGINEERING RECEIPTS

FOR FISCAL YEAR ENDING MARCH 31, 1909

Engineering.....	\$11,373 50
Car fare	501 40
Blue Printing.....	34 81
Postage	7 50
Testing—Cartage	1 05
Inspection.	16 25
Sale of map cloth.....	1 25
“ “ office supplies.....	1 25
	<hr/>
	\$11,937 11
Accounts Receivable on hand March 31, 1909.....	3,815 58

INSPECTION—

Street Opening—Work..	\$ 988 32
“ “ Street.....	887 59
“ “ Corporation.....	530 80

INSPECTION—

Improvements	£ 4,708 87
Sewers	4,027 37
Flood work.....	1,957 69
Water Works and Extension....	851 58
Ann Street Bridge.	194 44
Scarlet Fever Hospital	}
Tuberculosis "	
Smallpox "	
Street signs	7 20
Poles	645 00
<hr/>	
£14,570 11	

Respectfully,
L. W. ANDERSON,
City Engineer.



